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of The AMERICAN DIETETIC ASSOCIATION

AUGUST 1961 VOLUME 39 NUMBER 2

New Horizons in Food
Jane C. Ebbs

Nutrients in Dehydrated Foods
Miriam H. Thomas and Doris H. Calloway

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Fighting Food Faddism
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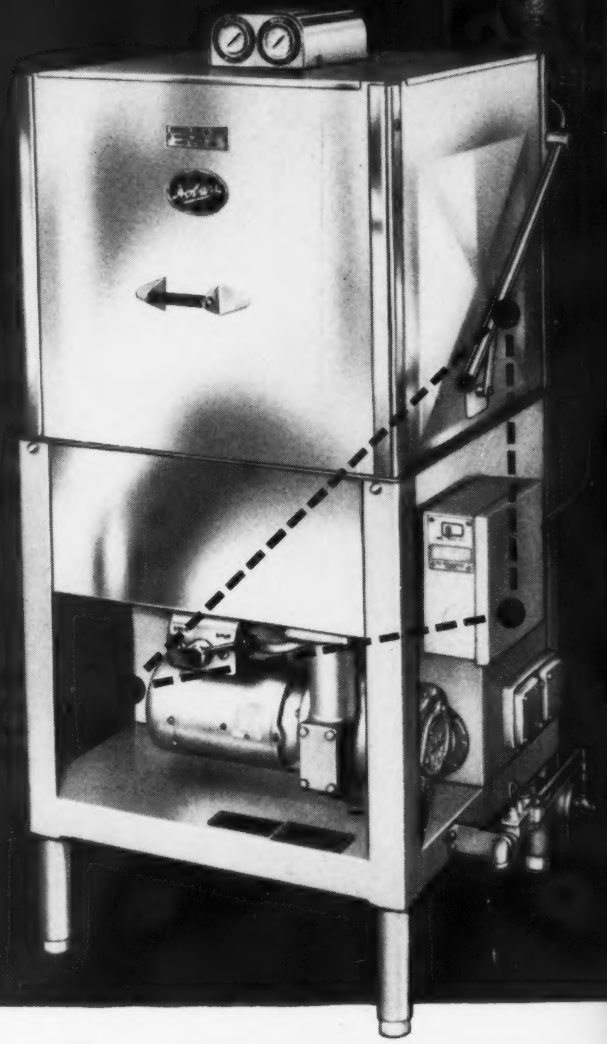

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New Horizons for Food[1]

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IT IS highly significant that apprehension is being voiced publicly by reputable groups and individuals about the damage food fallacies, misinformation, and ignorance can do to the health and well-being of people. A constant threat is the use of popular advertising media to undermine the public's confidence in foods as they are purchased at the grocery store.

The sometimes veiled and sometimes implied notion that food technology, improved agricultural processes, engineering and scientific achievements, modern food distribution, and storage have so destroyed the value of food that "food supplements" are a must is without fact. The encouragement to rely not on food for nutrition but on pills, powders, and fancy "food supplements" is a potential threat to the health and well-being of the nation when claims are made that, by taking such preparations, certain symptoms will disappear and good health is assured.

As dietitians and nutritionists, we know that, except for specific cases, the best way to assure an adequate diet is through selection of a variety of foods. Indeed, a recent government publication of the Food and Drug Administration says: "In fact, Americans have to go out of their way, nutritionally speaking, to avoid being well nourished." Whether you subscribe wholeheartedly to that statement, the fact remains that in these United States, an adequate food intake is a matter of selecting a varied and mixed diet following relatively simple dietetic instruction and guidelines.

It is unfortunate that not-so-subtle "hidden persuasion" peddles pills and powders instead of food, and sometimes promises a "cure."

It is unfortunate, too, that promotion of certain products implies that the more you get of a nutrient, the better off you will be.

A look backward over the decades of American history reveals the improved understanding of nutrition brought about by research and education, and the beneficial changes in food habits made possible by feats of engineering, modern transport, improvements in agricultural methods, and advances in food technology and its related disciplines. With these advances have come problems, although, of course, the opportunities for better nutrition and more conveniences for the consumer far outweigh the problems. Today, the promise of the future is for even greater opportunities.

No longer are foods consumed only in the area in which they are grown. Today, it is taken for granted that fresh produce grown in one geographic area will be transported to another distant region for consumption. Out-of-season fresh vegetables and fruits are consumed as a matter of course.

Similarly, processed food assures a twelve-month season. Canned items now constitute a large percentage of our daily market order. The use of frozen food is also taken as a matter of course. Foods preserved by "irradiation" will one day be available. Greatly improved methods for dehydration of foods, both cooked and uncooked, give further evidence of the expansion and advancement of the science of food technology.

As dietitians and nutritionists, we also recognize that eternal vigilance is needed from harvest to consumption to maintain food identity, nutritive value, wholesomeness, and safety. But do processors, distributors, and consumers realize sufficiently that the quality of the raw food at the time of processing is basic?

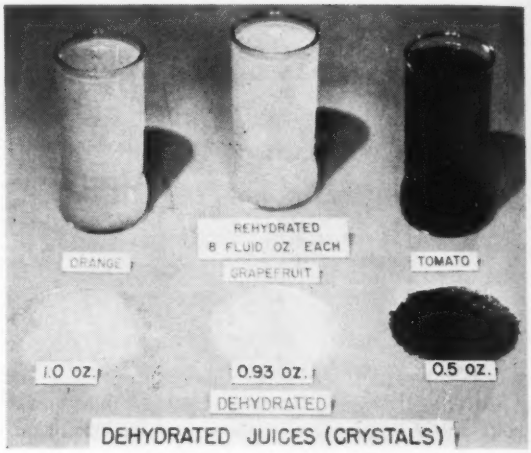
The quality of the raw food is critical whether it is to be processed by techniques of canning, freezing, dehydration, irradiation—or, by the cook for immediate consumption. Abuse of the raw material by unfavorable temperatures of transport, storage, or marketing techniques is reflected in changes of quality, including nutritive value.

Care of Frozen Foods

In the field of frozen food, the temperature of storage is a critical factor. Exposure to high temperatures destroys original quality. After many years of research carefully undertaken at great expense to both industry and the federal government, the United States Department of Agriculture advises:

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 19, 1960.

ALL CHANGES THAT RESULT IN QUALITY LOSS ACCELERATE AS TEMPERATURE RISES ABOVE 0°F
0°F
REFREEZING TO 0°F DOES NOT CORRECT DAMAGE DONE
0°F
EACH TIME TEMPERATURE RISES OVER 0°F MORE DAMAGE IS DONE. THE EFFECT IS CUMULATIVE.
0°F



(a) All changes that result in loss of quality accelerate as temperatures rise from 0°F. At 15°F., the changes are several times more rapid than at 0°F., and at 25°F. to 30°F., several times faster than at 15°F.

(b) Lowering the temperature of a frozen food which has been subjected to temperature above 0°F. *does not* correct the damage done. What is lost is lost forever. Each fluctuation takes its toll in flavor, texture, color, and nutrients; *and* the result is cumulative.

This means that from the moment of freezing by the processor to the time for cooking the meal, the frozen food should be held at 0°F. or below. It means that the warehouse, the railroad car, the truck, the local distribution point, and the retailer's cabinet should be maintained at 0°F. or below. The institutional or home kitchen must also safeguard such products.

The addition of precooked frozen items to the conventional uncooked frozen food line presents more opportunities to the dietitian to select easy-to-prepare meals of high acceptability and nutritive value.

The demand for precooked frozen foods and complete precooked frozen meals to simplify food service, both in the home and institution, has created many problems for the food technologist. The variety of ingredients in the individual dish, the seasoning, the gravy, and the multiple dessert items challenge the researcher. The food technologist must develop not only processing techniques, but also proper and adequate containers and wraps.

Freeze-Dehydration[2]

The practice of taking water out of a food to preserve it is many centuries old. Today, by the efforts of the food technologists, a means of dehydration has been developed which gives promise of products comparable to frozen foods, or even fresh foods. This technique is called freeze-dehydration.

Freeze-dehydration has many advantages over previously used methods for dehydration. It gives an end product that reconstitutes easily and to a volume comparable to that of the raw material. Further, the moisture content of the finished product is extremely low. This low moisture content, when coupled with the use of an antioxidant, means that the quality of the dried item, when properly packaged, will remain stable during long storage.

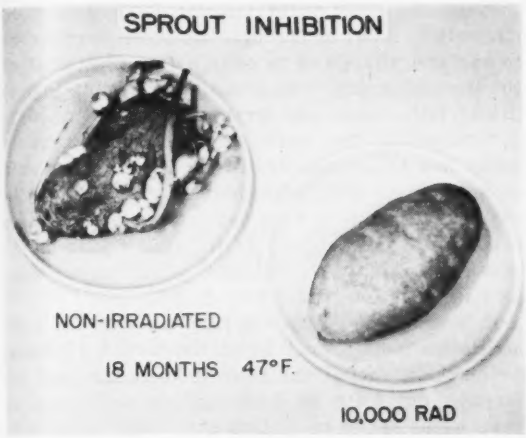
The technique of freeze-dehydration involves two important aspects and is currently a slow process. First, the water in the food must be held in the frozen state during the entire process. Second, the process is carried out under a vacuum. In the procedure now used, the rate of heat transfer is slow. This is because of the time it takes to transfer the heat from the source to and through the item to sublimate the ice directly to vapor without going through the liquid phase.

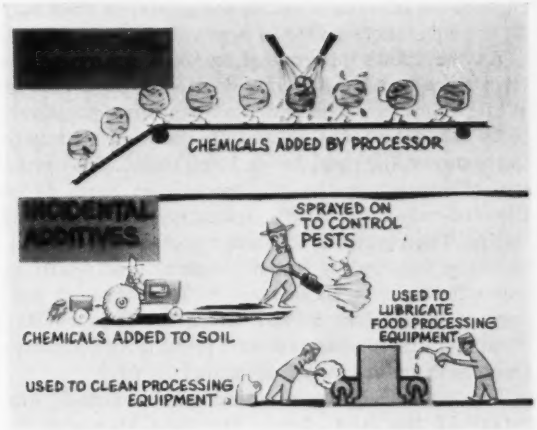
Unfortunately, because of the extended period of time the product must be in the dryer, freeze-dehydration at present is costly as compared with canning, freezing, and conventional dehydration processes. With capital investment in equipment, the cost of the end product is influenced by the speed with which the equipment produces the end product. Hence, until the food technologist finds a way to transfer heat from source through the product at a faster rate to speed up the sublimation process, freeze-dehydration is unlikely to be economically competitive with other processing techniques.

One can be sure that the food technologist will triumph over this problem, and food processed by freeze-dehydration will be commercially available.

The benefits of foods thus preserved cannot be overemphasized. Not only will they have texture,

[2]Not to be confused with "dehydro-freezing," which is simply removing 50 per cent of the water from commercially frozen items.

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CHEMICALS ADDED TO SOIL
USED TO CLEAN PROCESSING EQUIPMENT

volume, appearance, flavor, nutritive value, and acceptability comparable with fresh or frozen foods; they will also have the benefits of being either a precooked or uncooked item, will require no refrigeration, will require a minimum of pantry space for storage, and will have a long shelf-life.

Food Preservation by Irradiation

No discussion of food processing techniques of the future would be complete without recognition of the use of ionizing radiations to preserve food. About seven years ago, the Quartermaster Corps commenced to explore the potential of utilizing ionizing energy to preserve food. Although the effort was primarily to exploit the advantages for military feeding purposes, the program was to spearhead the national effort as a part of President Eisenhower's Atoms-for-Peace Program.

The result of these years of effort show that utilizing ionizing energy is feasible and the preservation by irradiation can be achieved. Much work must yet be done, for much more must be known before processing of food by irradiation can become a reality. That it will become a reality, the scientist is confident. Current plans are for the Quartermaster Corps to administer a six-year program aimed to develop means of preserving the components of the military ration which research thus far shows to be most promising of early success. These are: irradiated sterilized pork, ham, chicken, and beef processed by high doses of irradiation; and irradiation pasteurization of fresh fruits by low doses of irradiation to lengthen the storage life of these highly perishable items.

Rumors and proverbial pessimists notwithstanding, there is strong national interest, born out of experience and confidence, in speeding up the exploitation of this promising use of atomic energy.

Role of Food Additives

In the harvesting, transport, processing, and storage of food, changes take place which affect flavor, appearance, nutritive value, or any combination thereof. We must also recognize the part that chemicals have played in improving the quality and quantity of our food supply.

The agriculturist uses chemicals to overcome soil deficiencies, to control insects, and to protect crops and animals from disease.

The food processor uses chemicals to stabilize nutritive value during processing and storage, to put back nutrients that have been destroyed in processing, and to improve or maintain the characteristic flavor and appearance of the food. Chemicals are used to develop packaging materials and containers for increased durability, protectiveness, convenience, and eye appeal.

The addition of chemicals to food for preservation is nearly as old as man. Beginning with the use of salt hundreds of centuries ago to the present day, chemicals have been deliberately added to food for this purpose. Progress in science has made more combinations of chemicals possible than the simple sodium chloride (salt) of the early days, as, for example, the chemical called methyl-para-hydroxy benzoate now used widely as a preservative.

It is unfortunate that the word "chemical" has such a mystical and alarming connotation for so many people. Perhaps, if by some means of communication, it could be understood by all ages of people that any food is but a combination of chemicals, the suspicion attached to that word would disappear.

The term "food additives" is used to describe chemicals which are directly and purposely added to our food. Food additives may be specific nutrients, such as amino acids, vitamins, minerals, or non-nutritive sweeteners, or preservatives to prevent spoilage. They may be surface active agents added to create or enhance a characteristic such as smoothness, volume, or keeping quality. They may be flavoring agents, such as those used in candy,

carbonated beverages and baked goods; or they may be the substances added to beer to prevent foaming.

As the 1950's progressed, more and more additives were being incorporated into the food supply. While many had been tested and shown conclusively to be safe, there was always the question surrounding many which had never been tested. The problem of protecting the consumer from harm faced the federal government, industry, and scientific bodies. The resulting consumer protection from untested or improperly tested chemical food additives was effected by the Congress in 1958 through passage of Public Law 85-925, called the Delaney Bill. Food manufacturers must now prove a food additive to be safe before it can be added to food.

The problem of maintaining wholesomeness and safety of the food supply has thus been met by legislation, although many problems of enforcement are yet unsolved. There still remains, however, a problem regarding the addition of specific nutrients to food, both from the standpoint of suitability and public safety.

In 1953, the Food and Nutrition Board of the National Academy of Sciences and the Council on Foods and Nutrition of the American Medical Association published jointly a policy on this subject entitled "Statement of General Policy in regard to the Addition of Specific Nutrients to Foods" In this document, they reaffirmed their previous statements on the subject. As before, the desirability of meeting the nutritional needs of the people by the use of natural foods was stressed. The necessity of educating people in the proper choice and preparation was stressed. Equally stressed was the hope that by the continued improvement in food handling, production, processing, storage, and distribution, the essential nutrients native to the food would be better preserved. The guidelines were essentially as follows:

(a) Only food suffering loss of nutrients in refining or processing should be treated, and then, only the nutrients native to the food should be added back at a level native to the food.

(b) Exceptions to this may be made only when qualified judgment indicates that the addition of other than natural levels is essential in the interest of public health.

This is a statement of recommended policy made, I believe, by those best qualified to pass judgment on the subject. It is, however, simply a statement of policy and in no way does it prohibit a manufacturer from adding any nutrient to any product he so chooses in any amount he deems will have the most advertising appeal. Only legislation of Congress or a state law can do this.

No one challenges the benefits which have accrued through enrichment of bread, flour, and other cereals to replace the nutrients lost in processing; through the addition of vitamin D in prescribed amounts to milk; or through the addition of iodine to salt and vitamin A to certain fats. But what of the increasing practices of adding vitamins to soft drinks, milk drinks, and synthetic drinks in amounts far exceeding the levels occurring in a product which is a natural source of the nutrient? Is it safe or suitable to add indiscriminately vitamin D in vast quantities to a food supplement to be fed to children in a beverage? Is it safe or suitable to allow indiscriminate additions of a single amino acid in large quantities to a food?

It is my personal opinion that the time for such legislation is here. Such legislation would, I believe, do much to curtail the false information and inferences put forth by food faddists and bogus or overzealous health promoters who would undermine public confidence in our food supply and the progress being made by the agriculturist and food technologist.

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Nutritional Value of Dehydrated Foods[1]

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THE SEARCH for new and improved methods of preserving foods for consumption at a later time is a continuing activity of the Armed Forces in order to assure adequate nutriture of military personnel. Certain characteristics required of military subsistence—ease and speed of preparation in the field, long shelf-life, and economy of space—have counterparts in the desired characteristics of convenience foods for the civilian market. Military interest in dehydration stemmed primarily from the potential savings in weight of foods moved and stored, for, of the 1800 lb. purchased per man per year for mess-hall feeding, about 70 per cent is water. Secondarily, many foods were expected to be more stable and palatable after dehydration than after thermal processing, and some new foods could be added to the packaged ration system.

Prior to dehydration, all vegetables and some fruits are blanched to inactivate enzymes, fix color, and remove extraneous materials and gases. Sulphites or sulphur dioxide are frequently added at this stage to improve product stability. The cooking of foods usually causes chemical changes in heat-sensitive constituents, such that water is released, and, if the food is to be cooked before eating, it is often advantageous to remove some water initially by this procedure. The pre-cooking procedure also yields a product which requires little field preparation, improving military utility.

Dehydration is usually accomplished by vaporizing water with the addition of heat, transferring the water to the food surface, and removing the water vapor from the surface. In tunnel and belt dehydrators used, for example, for drying diced potatoes, carrots, cabbage, and pre-cooked beans and rice, the product is exposed to a moving stream of heated air in the temperature range of 140° to 200°F. When the material to be dried can be made into a paste, such as mashed potatoes and tomato purée, it may be spread on a rotating, steam-heated drum. Liquids are frequently dispersed in fine droplets and dried in an upward-flowing warm air stream. This spray method is normally applied to milk, eggs, and coffee. Some liquid products which are quite sensitive to heat, such as fruit juices, can be dried successfully by the vacuum process at lower temperatures, because reducing the air pressure lowers the boiling point of water.

A further reduction in chamber pressure to about 1 mm. of mercury permits drying in the frozen state with the water passing directly from a solid to a vapor phase. This process of freeze-drying results in the least change in the physical characteristics of the product and is finding increasing usefulness in the dehydration of problem foods, such as meats and some vegetables.

A cursory review of the techniques involved in dehydration shows several steps in which nutrient losses might be anticipated. Leaching of all water-soluble compounds can occur in washing and some blanching procedures. Heat treatment is damaging to most of the major vitamins, protein, and essential fatty acids, with destruction usually accelerated in the presence of air and light. Nutrient stability is also influenced by the acidity or alkalinity of the product, and/or by the presence of active enzymes and such processing aids as sulphite. However, some

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or all of these potentially damaging agents are encountered in all conventional methods of preservation.

It became necessary, then, to determine whether dehydrated foods are at least equally as nutritious as the other processed foods they will supplant. Ideally, they should be better. Therefore, studies were carried out to ascertain the composition of these products and to compare nutritional quality of foods processed by accepted methods and methods competing for adoption. Additionally, human feeding tests were conducted for evaluation of the digestibility and physiologic adequacy of typical foods by Drs. Roy Korn and Richard Eckhardt at the Chicago West Side Veterans Administration Hospital.

Procedure

Since valid comparisons can be made only when all samples derive from the same starting material, a study was conducted in which three processing methods were applied to portions of a single lot of product. Five representative foods of animal origin—chicken, beef, pork, shrimp, and bacon—and four plant products—cabbage, carrots, corn, and green beans—were chosen. Tests were made on the raw products and after dehydration, irradiation, and the usual thermal process. In most cases, samples were dehydrated both in the raw and cooked state; irradiated samples were either enzyme-inactivated or fully cooked before irradiation. Except for bacon, all animal products were frozen before dehydration under reduced pressure. All vegetables were exposed to heated air to accomplish dehydration. Cabbage was the only product which was not thermally processed in a can. The starting material in four instances—chicken, shrimp, green beans, and corn—was a commercially frozen product rather than a fresh sample. The samples were then cooked by a method appropriate to the product and again analyzed for their contribution of certain of the major vitamins.

Details of processing are given below. For brevity, samples classes have been coded as follows: A, dehydrated in the raw state; B, precooked, dehydrated; C, irradiated after enzyme-inactivation; D, precooked, irradiated; and E, conventionally canned. Code 1 refers to processing treatment, code 2 to preparation for serving.

I. Bacon.
   A. Dehydrated in the raw state. No sample.
   B. Not dehydrated but comparable product; prefried bacon loses some moisture in frying and no further processing is required.
      1. Combination cured for 6 days; smoked for 18 hr.; sliced; cooked at 350°F. in an oven until crisp; and sealed in cans at 25 in. vacuum.
      2. Heated in an oven for 15 min. at 400°F.
   C. Irradiated after enzyme-inactivation.
      1. Dry cured for 16 days; smoked for 24 hr.; sliced; rolled in parchment; and sealed in cans at 10 in. vacuum.
      2. Broiled at 550°F. for 4 min. on one side and 1½ min. on the other.
   D. Precooked, irradiated.
      1. Combination cured for 6 days; smoked for 18 hr.; sliced; cooked at 450°F. in an oven until crisp; and sealed in cans with an oxygen scavenger.
      2. Same as I. B.2.
   E. Conventionally canned.
      1. Dry cured for 16 days; smoked for 24 hr.; sliced 9/64 in. thick; rolled in parchment; sealed in 401 x 411 cans at 25 in. vacuum; and pasteurized at 165°-170°F. for 2 hr.
      2. Same as I. C.2.

II. Beef (fresh chuck cut into 1 x 1 in. strips and ground through ¼ in. plate grinder).
   A. Dehydrated in the raw state.
      1. Made into 3¼-oz. patties; frozen at −42°F.; and freeze-dehydrated.
      2. Rehydrated 20 min.; drained; and grilled 2½ min. on each side at 450°F.
   B. Precooked, dehydrated.
      1. Placed in loaf pans and cooked for 55 min. in a retort at 212°F. to an internal temperature of 145°-155°F.; cooled at 40°F. for 4 hr.; frozen at −42°F.; sawed into ½-in. slices; and freeze-dehydrated.
      2. Rehydrated 20 min.; drained; and grilled 2 min. on each side at 450°F.
   C. Irradiated after enzyme-inactivation.
      1. Made into 3¼-oz. patties; cooked for 25 min. in a retort at 205°F. to an internal temperature of 165°F.; and sealed in cans at 15 in. vacuum.
      2. Heated in a double boiler for 20 min. and then grilled 2 min. on each side at 450°F.
   D. Precooked, irradiated.
      1. Made into 3¼-oz. patties; fried in deep fat for 6 min. at 300°F.; and sealed in cans at 15 in. vacuum.
      2. Grilled for 1¼ min. at 450°F. on each side.
   E. Conventionally canned.
      1. Made into 3¼-oz. patties; fried in deep fat for 1 min. 20 sec. at 350°F.; sealed in 300 x 409 cans at 20-22 in. vacuum; and heated for 90 min. at 250°F.
      2. Cans were placed in a boiling water bath for 30 min. and contents drained.

III. Chicken.
   A. Fresh, frozen chicken thawed in cold water overnite at 40°F.
      1. Skinned and boned; stuffed into casings; frozen at −42°F.; sawed into ½-in. thick slices; and freeze-dehydrated.
      2. Rehydrated 30 min. in a salt solution; simmered for 50 min. in the same solution; and drained.
   B. Same as III. A.
      1. Simmered for 50 min.; cooled at 40°F.; skinned and boned; dipped in boiling water; packed into metal molds; frozen at −42°F.; sawed into ½-in. thick slices; and freeze-dehydrated.
      2. Rehydrated for 30 min. in a boiling salt solution and drained.
   C. Fresh, frozen chicken thawed in a continuous stream of cold tap water.
      1. Cooked in a retort on trays to an internal temperature of 160°F. (approximately 25

min.); sealed in cans at 15 in. vacuum.
2. Simmered for 30 min. in a salt solution, drained, and boned.

D. Same as III. C.
1. Breasts were roasted for 1¾ hr.; legs and thighs were roasted for 1 hr. and 10 min. at 350°F.; sealed in cans at 15 in. vacuum.
2. Boned (to be added to hot white sauce).

E. Fresh, frozen chicken.
1. Cooked in a retort on trays at 212°F. for 35 min.; skinned and boned; 1½ lb. of meat put in 401 x 411 cans with 6 oz. of salted broth; sealed under 5 in. vacuum; and heated for 2½ hr. at 240°F., and water cooled.
2. Cans placed in a boiling water bath for 30 min. and contents drained.

IV. Pork loin (boned and fat trimmed to ¼-in. thickness).
A. Dehydrated in the raw state.
1. Rolled loosely in laminated aluminum foil; frozen at −42°F.; sawed into ½-in. thick slices; and freeze-dehydrated.
2. Rehydrated for 30 min.; drained; blotted; and grilled on each side for 2 min. at 450°F.

B. No sample.

C. Irradiated after enzyme inactivation.
1. Cooked for 50 min. in an oven at 212°F. to an internal temperature of 165°F.; sliced ½ in. thick; and sealed in cans at 7-12 in. vacuum.
2. Grilled on each side for 3 min. at 450°F.

D. Precooked, irradiated.
1. Oven-cooked for 2½ hr. at 325°F. to an internal temperature of 185°F.; sliced ½ in. thick; and sealed in cans at 7-12 in. vacuum.
2. Grilled on each side for 2 min. at 450°F.

E. Conventionally canned.
1. Sliced ⅝ in. thick; deep fat fried at 350°F.; sealed in 300 x 200 cans with 15 ml. salted water at 25-28 in. vacuum; and heated for 50 min. at 250°F.
2. Cans placed in a boiling water bath for 30 min. and contents drained.

V. Shrimp (fresh-frozen, peeled, deveined).
A. Dehydrated in the raw state.
1. 6-lb. blocks sawed into ½-in. thick slices and freeze-dehydrated.
2. Rehydrated for 30 min., boiled for 4 min., and rinsed in cold tap water.

B. Precooked, dehydrated.
1. Thawed in a continuous stream of cold tap water; cooked for 4 min. in boiling water; immediately showered with cold water; drained; frozen at −18°F.; and freeze-dehydrated.
2. Rehydrated for 15 min. and rinsed in cold tap water.

C. Irradiated after enzyme-inactivation.
1. Thawed as in V.B.1.; cooked in boiling salted water for 2 min.; cooled; and sealed in cans at 28 in. vacuum.
2. Boiled for 3 min., then rinsed in cold tap water.

D. Precooked, irradiated.
1. Thawed as in V.B.1.; cooked in boiling salted water for 10 min., cooled; and sealed in cans at 28 in. vacuum.
2. Rinsed in cold tap water.

E. Conventionally canned.
1. Blanched in boiling brine for 10 min.; sealed in 300 x 407 cans with 2% salt solution at 5-10 in. vacuum; and heated for 25 min. at 240°F.
2. Same as V.D.2.

VI. Beans, green (Tendergreen, fresh-frozen).
A. Dehydrated in the raw state.
1. Steamed at 212°F. for 4 min.; dipped in sulphite solution for 2 min.; drained for 2 min.; and frozen at 0°F.; dehydrated for 45 min. at 190°F. dry bulb—90°F. wet bulb low velocity followed by 4½ hr. at 145°F. dry bulb—90°F. wet bulb medium velocity; and sealed in cans under vacuum.
2. Added to boiling water with the pan partially covered; allowed to simmer for 10 min.; then drained.

B. Precooked, dehydrated.
1. Steamed for 9 min. and treated as in VI.A.1.
2. Added to boiling water; stirred; allowed to stand in covered pan for 25 min.; drained.

C. Irradiated after enzyme-inactivation.
1. Steamed for 4 min. and sealed in cans under vacuum.
2. Added to cool water, heated to 180°F., and drained.

D. Precooked, irradiated.
1. Steamed for 9 min. and treated as in VI.C.1.
2. Same as VI.C.2.

E. Conventionally canned.
1. Steamed for 4 min.; sealed in 307 x 409 cans with hot 1% salt solution; processed at 240°F. for 25 min.
2. Can contents heated to 180°F. and drained.

VII. Cabbage (Copenhagen, outer leaves and core removed before dicing).
A. Dehydrated in the raw state.
1. Dipped for 1 min. in sulphite solution; dehydrated at 140°F. dry bulb—90°F. wet bulb for 4½ hr.; and sealed in cans under vacuum with desiccant.
2. Preparation for serving.
a. Cold: rehydrated with cool water; refrigerated for 30 min.; drained.
b. Hot: added to cool water, brought to a boil in a partially covered pan; simmered for 10 min.; drained.

B. Precooked, dehydrated.
1. Dipped 1 min. in a sulphite solution; steamed at 212°F. for 3 min.; and dehydrated as in VII.A.1.
2. Added to boiling water; stirred thoroughly; allowed to stand for 10 min.; drained.

C. Irradiated after enzyme-inactivation.
1. Packed into polyethylene casings, sealed, and casings sealed in cans. After irradiation, cans were punctured.
2. Preparation for serving.
a. Cold: chilled.
b. Hot: added to boiling water; brought to a boil in a covered pan; simmered for 7 min.; drained.

D. Precooked, irradiated.
1. Steamed at 212°F. for 3 min.; sealed in cans at 12 in. vacuum.
2. Added to boiling water and heated to 180°F.; drained.

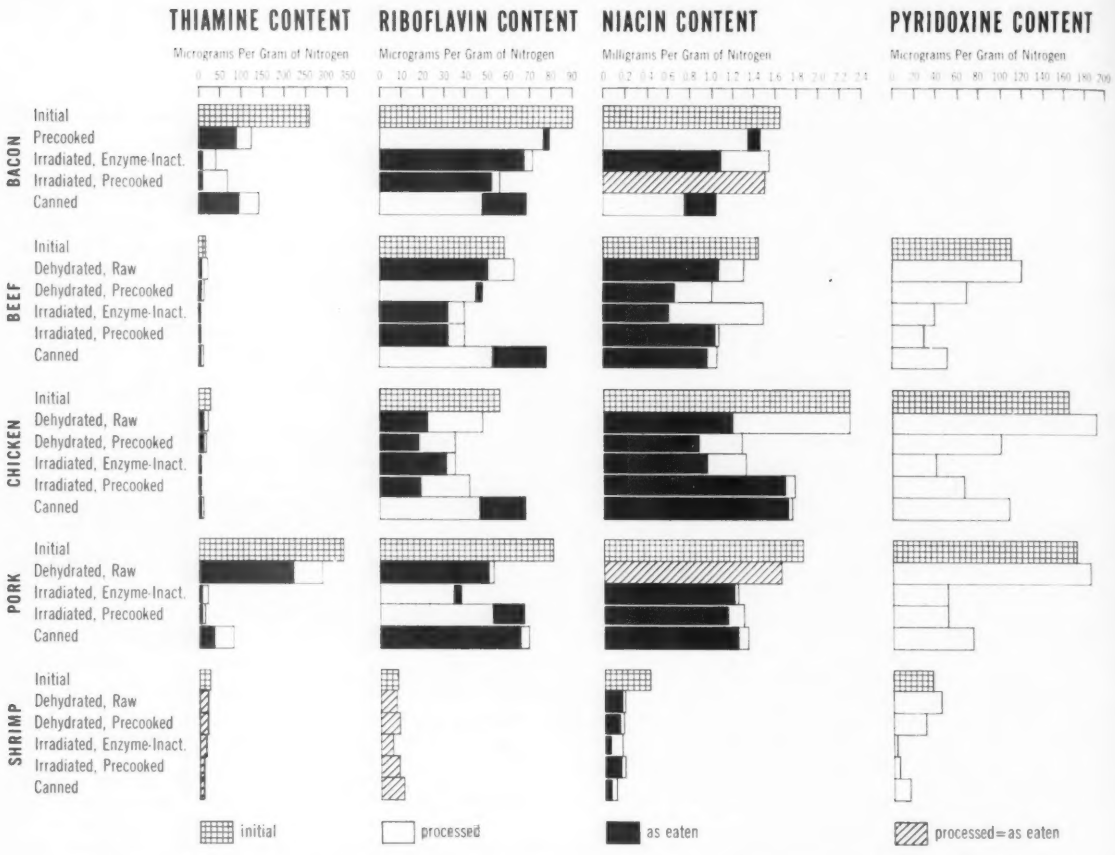

FIG. 1. *Thiamine, riboflavin, niacin, and pyridoxine content of processed animal products.*

E. Conventionally canned. No sample.

VIII. Carrots (Imperator; fresh-topped, peeled and sliced ⅛-3/16 in. thick).
- A. Dehydrated in the raw state.
  1. Steamed at 212°F. for 5 min.; dipped in sulphite solution for 1 min.; dehydrated at 165°F. dry bulb—90°F. wet bulb for 5 hr.; sealed in cans under vacuum with desiccant.
  2. Added to cool water; brought to a boil; covered; simmered for 12 min.; drained.
- B. Precooked, dehydrated.
  1. Steamed at 212°F. for 15 min. and treated as in VIII.A.1.
  2. Added to boiling water in a covered pan; stirred every 5 min. for 20 min.; drained.
- C. Irradiated after enzyme-inactivation.
  1. Steamed for 5 min.; cooled to 50°F.; and sealed in cans under vacuum.
  2. Added to cool water; heated to 180°F.; and drained.
- D. Precooked, irradiated.
  1. Steamed for 15 min. and treated as in VIII.C.1.
  2. Same as VIII.C.2.
- E. Conventionally canned.
  1. Steamed for 5 min.; packed in 307 x 409 cans with hot 1% salt solution; exhausted for 5 min. at 180°-200°F.; sealed and processed at 240°F. for 30 min.
  2. Can contents were heated to 180°F. and drained.

IX. Corn (Golden Bantam; frozen, whole kernel).
- A. Dehydrated in the raw state.
  1. Dipped in a sulphite solution for 1½ min.; dehydrated for 5 min. at 200°F. dry bulb—150°F. wet bulb; for 13 min. at 200°F. dry bulb—120°F. wet bulb; for 20 min. at 170°F. dry bulb—110°F. wet bulb; for 30 min. at 150°F. dry bulb—110°F. wet bulb; for 10½ hr. at 150°F. dry bulb—90°F. wet bulb; for 9¾ hr. at 120°F. dry bulb—85°F. wet bulb; sealed in cans under vacuum with desiccant.
  2. Added to boiling water and allowed to stand for 30 min., brought to a boil; simmered for 20 min., and drained.
- B. Precooked, dehydrated.
  1. Steamed for 12 min., sprayed for 1 min. with a sulphite solution and freeze-dehydrated for 4 hr. Then air dried for 4½ hr. at 150°F. dry bulb—90°F. wet bulb and for 9¾ hr. at 125°F. dry bulb—85°F. wet bulb. Sealed in cans under vacuum with dessicant.
  2. Added to boiling water; covered; allowed to stand for 25 min.; drained.
- C. Irradiated after enzyme-inactivation.

1. Steam-blanched and sealed in cans.
2. Added to cool water, heated to 180° F., and drained.

D. Precooked, irradiated.
1. Steamed for 12 min. and sealed in cans.
2. Same as IX.C.2.

E. Conventionally canned.
1. Steamed 4 min., packed in 307 x 409 cans with hot 1% salt solution; processed at 240°F. for 25 min.
2. Can contents were heated at 180°F. and drained.

Results

ANIMAL PRODUCTS

Proximate analysis and vitamin content of the processed animal products are given in Table 1. In Figure 1, the B-complex content is compared on the basis of equivalent nitrogen. Initially, only pork loin and bacon contained substantial amounts of thiamine. In pork, this vitamin was retained well during freeze-dehydration and preparation for serving (Figure 1). In irradiated pork samples, 99 per cent was lost as prepared. About half of the thiamine in bacon was retained after prefrying and canning and 35 per cent of the initial content remained after cooking. Destruction due to irradiation of bacon was 80 per cent; 99 per cent was lost after cooking. The superior retention of thiamine in cooking of bacon as compared with pork loin chops may be related to the shorter cooking time due to thinness of the slices. In all products, thiamine retention was most favored by freeze-dehydration and least by irradiation.

All products except shrimp were high in riboflavin initially, and this vitamin was fairly stable during processing (Fig. 1). Little additional loss was encountered in products cooked by dry heat. In some instances, riboflavin increased after preparation, e.g., canned bacon, beef, and chicken. The phenomenon of increasing riboflavin content has been noted previously in this laboratory (5). The increase could be due to development of fluorescing compounds or to release of some bound form by heat. In either event, the compound fulfills the function of riboflavin in microbial systems; availability for higher animals is unknown. If this substance is actually riboflavin or its equivalent, canning would be the method of choice; otherwise, there is no uniform superiority of any method.

Niacin was also well preserved in processing, and no one method was consistently better than another (Fig. 1). Essentially, no additional losses were noted on preparation for consumption of pork chops and bacon. In beef and chicken, preparatory losses occurred in both dehydrated and enzyme-inactivated, irradiated products. In irradiated products as eaten, samples cooked before irradiation tended to be higher in niacin than those cooked after irradiation. It was reported previously that irradiated turkey showed less water-binding quality and larger "drip"

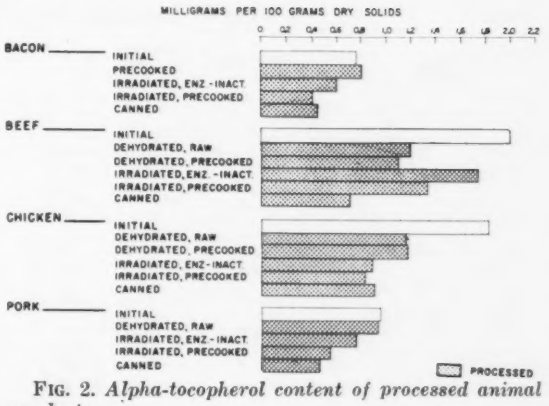

FIG. 2. *Alpha-tocopherol content of processed animal products.*

losses on cooking than the non-irradiated product (6), which may account for this difference.

Content of lesser-known vitamins was assessed only after processing. Pyridoxine was completely stable in all products freeze-dried in the raw state (Fig. 1), and only 25 to 40 per cent was destroyed by precooking. In contrast, losses ranged from 65 to 100 per cent in irradiated samples, unrelated to prior cooking. Thermal sterilization resulted in 35 per cent loss in chicken, 55 to 60 per cent in beef and pork, and 75 per cent in shrimp. Obviously, freeze-dehydration is the preferred method for preservation of foods which make a significant contribution of vitamin B_6.

Pantothenic acid was reasonably stable, regardless of processing technique employed. No apparent loss of folic acid occurred; however, the initial content of this vitamin was too low to permit an accurate evaluation of its stability.

In all animal products, tocopherol content of dehydrated samples was greater than that of thermally sterilized counterparts (Fig. 2). The effects of irradiation varied, but in all cases irradiated products were equal or superior to the canned.

Findings in beef were different from all other products, in that the tocopherol of irradiated samples exceeded that of the dried material. The small particle size of ground beef permitted greater opportunity for oxidation and the dehydrated samples were not protected from exposure to air at any stage; irradiated samples were vacuum-sealed prior to treatment. Whether this accounts for the variance cannot be determined from present information, but the evidence is sufficiently suggestive that consideration should be given to investigating the quality of dried products processed in an inert atmosphere.

As shown in Table 2, the initial low content of polyunsaturated fatty acids was well preserved in processed beef and pork. Chicken, initially high in dienoic fatty acid, sustained a 20 per cent loss on dehydration and 30 per cent loss by irradiation or canning. Although of little nutritional signficance

TABLE 1 **Proximate composition and vitamin content of processed animal products**

STATE OF SAMPLE	MOISTURE (1)	PROTEIN (N x 6.25) (1)	FAT (1)	THIAMINE (2)	RIBOFLAVIN (2)	NIACIN (2)	PYRIDOXINE (3)	PANTOTHENIC ACID (2)	FOLIC ACID (1)	ALPHA-TOCOPHEROL (4)
	←gm./100 gm.→			←mcg./100 gm→		mg./100 gm.	←mcg./100 gm.→			mg./100 gm.
Bacon										
Raw	20.1	8.9	66.3	373	132	2.36		400		0.62
Processed										
Precooked	8.4	20.2	66.0	412	257	4.35		820		0.74
Irradiated after enzyme inactivation	15.9	8.6	70.7	63	101	2.10		290		0.52
Irradiated, precooked	12.6	21.6	59.3	227	197	5.18		860		0.36
Canned	8.3	20.3	65.2	453	154	2.36		520		0.41
As eaten, broiled										
Precooked	5.8	29.1	53.6	446	380	6.75				
Irradiated after enzyme inactivation	6.0	19.9	65.5	8	221	3.41				
Irradiated, precooked	6.1	29.3	52.0	13	254	7.00				
Canned	8.2	25.0	55.9	405	280	4.07				
Beef Chuck, Ground										
Raw	*61**	17.7	20.2	52	170	4.10	300	460	3	0.79
Processed										
Dehydrated, raw	1.1	46.1	51.2	144	468	9.70	900	1010	11	1.18
Dehydrated, precooked	1.0	58.2	39.4	96	436	9.50	680	900	10	1.09
Irradiated after enzyme inactivation	*53*	27.1	18.3	4	176	6.48	160	400	2	0.82
Irradiated, precooked	*49*	31.7	18.0	7	210	5.51	170	500	3	0.68
Canned	*56*	24.9	18.3	11	216	4.25	200	420	3	0.31
As eaten, grilled										
Dehydrated, raw	41.7	29.9	25.3	7	246	5.12				
Dehydrated, precooked	44.5	29.9	21.9	10	236	3.05				
Irradiated after enzyme inactivation	47.4	29.2	21.2	7	148	2.79				
Irradiated, precooked	48.9	28.5	19.4	7	148	4.68				
Canned	55.3	28.9	14.1	8	368	4.45				
Chicken										
Frozen, raw	*77*	18.8	2.7	57	175	6.90	500	960	4	0.42
Processed										
Dehydrated, raw	1.5	84.0	13.6	198	665	30.80	260	3960	26	1.15
Dehydrated, precooked	1.2	88.2	10.5	122	518	18.40	140	1980	14	1.16
Irradiated after enzyme inactivation	*66*	28.4	4.2	2	169	6.10	180	980	4	0.30
Irradiated, precooked	*66*	28.7	3.9	5	202	8.25	300	1220	4	0.28
Canned	*71*	24.3	3.9	9	187	6.90	420	850	5	0.26
As eaten, simmered										
Dehydrated, raw	71.4	22.4	2.4	27	86	4.22				
Dehydrated, precooked	69.4	24.5	2.6	33	76	3.40				
Irradiated after enzyme inactivation	64.7	28.0	5.1	5	150	4.21				
Irradiated, precooked	59.0	30.7	6.8	5	102	8.35				
Canned	67.5	24.2	3.9	5	276	6.66				
Pork Loin										
Raw	58.0	16.1	26.8	865	211	4.82	440	700	<1	0.40
Processed										
Dehydrated, raw	1.0	46.1	51.1	2130	399	12.30	1360	730	2	0.93
Irradiated after enzyme inactivation	51.3	24.4	23.0	22	140	4.90	200	340	<1	0.37
Irradiated, precooked	46.2	21.2	32.4	17	185	4.47	170	300	<1	0.29
Canned	48.5	23.3	27.2	313	265	5.08	270	440	<1	0.22
As eaten, grilled										
Dehydrated, raw	35.9	30.6	32.6	1080	253	8.20				
Irradiated after enzyme inactivation	38.7	30.3	28.2	10	196	5.85				
Irradiated, precooked	37.4	27.9	33.6	15	304	5.10				
Canned	49.0	28.1	21.7	166	300	5.65				
Shrimp										
Frozen, raw	84.8	14.1	0.6	18	19	0.91	80	200	3	
Processed										
Dehydrated, raw	1.8	90.6	3.4	45	107	2.35	610	180	24	
Dehydrated, precooked	1.5	92.3	4.1	48	123	2.22	400	250	9	
Irradiated after enzyme inactivation	77.5	19.8	1.0	8	18	0.44	10	60	2	
Irradiated, precooked	74.0	24.1	1.0	7	20	0.57	15	70	2	
Canned	75.9	18.2	1.1	5	34	0.25	40	350	2	
As eaten, boiled, cold										
Dehydrated, raw	77.5	21.4	1.0	13	29	0.44				
Dehydrated, precooked	78.2	21.1	0.9	13	32	0.41				
Irradiated after enzyme inactivation	77.4	21.8	0.9	8	80	0.17				
Irradiated, precooked	77.0	22.9	1.0	5	32	0.50				
Canned	76.0	21.6	0.9	4	35	0.19				

*Italicized numbers are imputed from other data, not analytical values.

TABLE 2 **Polyunsaturated fatty acids in processed animal products (7)**

STATE OF SAMPLE	HEXAENE	PENTAENE	TETRAENE	TRIENE	DIENE	TOTAL
			Beef Chuck, Ground			
	←		*gm./100 gm. crude fat*			→
Raw	0.03	0.07	0.10	0.45	0.69	1.34
Processed						
Dehydrated, raw	0	0.08	0.09	0.50	0.74	1.41
Dehydrated, precooked	0.03	0.09	0.10	0.53	0.88	1.63
Irradiated after enzyme inactivation	0	0.08	0.11	0.45	0.54	1.18
Irradiated, precooked	0.09	0.05	0.07	0.36	0.83	1.40
Canned	0.01	0.07	0.10	0.40	1.03	1.61
			Chicken			
Frozen, raw	0.34	0.36	2.06	1.47	21.77	26.00
Processed						
Dehydrated, raw	0.26	0.27	1.17	1.46	18.35	21.51
Dehydrated, precooked	0.25	0.28	1.33	1.42	16.58	19.86
Irradiated after enzyme inactivation	0.26	0.21	0.78	1.16	16.22	18.63
Irradiated, precooked	0.25	0.25	0.77	1.26	14.94	17.47
Canned	0.21	0.21	1.04	1.42	14.72	17.60
			Pork Loin			
Raw	0.05	0.06	0.21	0.52	7.01	7.85
Processed						
Dehydrated, raw	0.06	0.04	0.21	0.50	6.02	6.83
Irradiated after enzyme inactivation	0.03	0.06	0.20	0.43	6.73	7.45
Irradiated, precooked	0.06	0.06	0.22	0.49	7.40	8.23
Canned	0.01	0.05	0.19	0.47	6.39	7.11
			Shrimp			
Frozen, raw	7.07	10.76	5.23	2.30	1.07	26.43
Processed						
Dehydrated, raw	5.84	7.01	3.50	1.63	1.34	19.32
Dehydrated, precooked	4.37	6.08	2.91	1.41	0.92	15.69
Irradiated after enzyme inactivation	2.91	3.64	2.39	1.56	0.83	11.33
Irradiated, precooked	2.18	3.43	1.66	0.87	1.14	9.28
Canned	1.68	1.86	1.21	0.56	0.46	5.77

because of the low level of total lipid in shrimp, the behavior of the unsaturated acids was most discriminatory of processing changes in this sample. Shrimp fat was highly unsaturated, the bulk of the polyunsaturated acids bearing five and six double bonds. Dehydration in the raw state resulted in 27 per cent loss, increasing to 41 per cent by precooking. Comparable irradiated samples showed 57 and 65 per cent decreases. The greatest decrement, 78 per cent, occurred in the canning procedure.

Examination of the data in Table 3, on essential and semi-essential amino acid content, reveals no destruction due to processing. In fact, there was a tendency toward increased amino acid content, particularly in chicken and pork, which was most pronounced in irradiated, precooked samples. Since the data are related to the nitrogen content of the products, it may be inferred that nitrogen was lost from sources other than these amino acids, by leakage or by conversion to volatile ammonia. Tsien and Johnson have reported (9) that glutamic acid, aspartic acid, serine, and glycine were destroyed in milk and beef by irradiation.

Important differences existed in the susceptibility of the protein of processed meats to the proteolytic enzyme, pepsin (Table 3). Only products dried in the raw state did not differ from their control samples. Processing methods showed the same rank order in all meats, dehydration producing least alteration and thermal sterilization, greatest. Decrement was smallest in beef and largest in shrimp, both in magnitude of change and number of amino acids affected. In all products studied, determination of phenylalanine or methionine alone would have discriminated among processing methods.

VEGETABLE PRODUCTS

Of the four vegetables studied, only cabbage contained a large amount of ascorbic acid, and this was well retained in the dehydrated products (Table 4). Following irradiation, however, no reduced ascorbic acid was present, most of the initial content having

TABLE 3 **Amino acid content of processed animal products (8)**

STATE OF SAMPLE	CYSTINE	HISTIDINE	ISOLEUCINE	LEUCINE	LYSINE	METHIONINE	PHENYLALANINE	THREONINE	TRYPTOPHAN	TYROSINE	VALINE
					Milligrams per Gram Nitrogen						
Beef chuck											
Raw	81	199	337	461	586	148	234	265	99	206	359
Processed											
Dehydrated, raw	83	217	285	454	604	143	245	282	87	185	339
Dehydrated, precooked	85	197	302	480	612	145	254	286	81	195	359
Irradiated, enzyme-inactivated	85	190	348	520	676	165	228	312	84	194	376
Irradiated, precooked	74	189	318	447	612	139	232	274	58	181	335
Canned	76	214	315	450	585	150	256	293	64	181	359
Chicken											
Frozen, raw	72	180	338	502	586	178	234	281	86	218	322
Processed											
Dehydrated, raw	66	191	352	520	608	170	248	290	80	199	329
Dehydrated, precooked	74	195	366	563	636	175	268	298	85	221	357
Irradiated, enzyme-inactivated	64	164	327	501	569	159	247	279	74	259	322
Irradiated, precooked	90	240	474	725	824	242	361	402	101	232	458
Canned	78	188	360	518	614	181	262	298	98	265	354
Pork loin											
Raw	79	232	315	499	631	158	258	293	84	184	352
Processed											
Dehydrated, raw	70	269	349	494	639	151	242	294	104	192	358
Irradiated, enzyme-inactivated	83	210	376	506	664	158	260	291	99	198	387
Irradiated, precooked	85	233	416	594	758	194	309	329	111	246	440
Canned	79	248	379	518	679	169	256	312	102	200	399
Shrimp											
Frozen, raw	94	124	335	485	599	182	256	240	92	206	301
Processed											
Dehydrated, raw	84	138	350	507	633	188	262	272	89	218	320
Dehydrated, precooked	94	142	328	541	650	195	285	268	97	218	310
Irradiated, enzyme-inactivated	88	134	387	544	670	201	271	274	102	234	334
Irradiated, precooked	91	138	365	556	676	194	289	281	98	225	336
Canned	100	149	374	612	695	222	315	301	102	227	356
					Percentage of Above as Free Amino Acids after *in Vitro* Pepsin Digestion*						
Beef chuck											
Raw	8	4	51	68	3	24	30	77	33	18	15
Processed											
Dehydrated, raw	7	4	60	68	2	23	27	72	37	18	16
Dehydrated, precooked	6	4	53	63	2	18	21	71	36	14	14
Irradiated, enzyme-inactivated	6	4	51	61	2	20	25	78	34	16	13
Irradiated, precooked	6	4	44	56	2	18	20	61	38	13	13
Canned	3	3	39	48	2	13	14	47	21	9	10
Chicken											
Frozen, raw	10	8	55	63	7	24	31	68	36	23	25
Processed											
Dehydrated, raw	10	6	54	63	4	24	27	65	38	22	20
Dehydrated, precooked	9	4	52	56	3	19	22	64	31	14	16
Irradiated, enzyme-inactivated	8	3	45	54	4	19	21	57	28	13	17
Irradiated, precooked	5	2	32	43	2	12	14	41	23	13	12
Canned	4	4	34	44	3	13	15	44	15	11	13
Pork loin											
Raw	10	4	50	64	3	24	30	74	36	20	18
Processed											
Dehydrated, raw	10	4	45	60	2	21	28	72	28	18	16
Irradiated, enzyme-inactivated	7	4	42	61	2	19	21	65	25	14	14
Irradiated, precooked	6	3	40	54	2	14	19	62	24	11	12
Canned	6	3	32	46	2	14	17	47	17	10	10
Shrimp											
Frozen, raw	8	7	57	71	6	26	30	83	32	18	20
Processed											
Dehydrated, raw	8	5	49	62	3	20	22	68	41	15	16
Dehydrated, precooked	7	4	50	55	2	17	18	66	36	14	15
Irradiated, enzyme-inactivated	5	4	38	53	2	15	20	63	19	11	13
Irradiated, precooked	4	3	35	47	2	14	17	58	17	11	12
Canned	4	3	29	41	2	11	13	49	23	10	11

*Acid or alkaline hydrolysis.

been converted to the oxidized form, reflected in the total content of 23 to 28 mg. per 100 gm. of these products. Most of the dehydroascorbic acid was destroyed on preparation of these irradiated samples for consumption.

Values for the beta-carotene content of raw and

TABLE 4 Moisture and vitamin content of processed vegetables

STATE OF SAMPLE	MOISTURE	BETA CAROTENE (2)	ASCORBIC ACID (2)	
			Reduced	Total
	gm./100 gm.	← *mg./100 gm.* →		
Green Beans				
Frozen, raw	92.5	0.12	3	4
Processed				
Dehydrated, raw	3.3	0.92	6	16
Dehydrated, precooked	3.4	0.87	10	15
Irradiated after enzyme-inactivation	89.8	0.28	0	4
Irradiated, precooked	89.6	0.23	0	4
Canned	93.2	0.26	0	1
As eaten				
Dehydrated, raw	88.6	0.52	0	2
Dehydrated, precooked	90.4	0.49	0	1
Irradiated after enzyme-inactivation	88.4	0.39	0	2
Irradiated, precooked	88.5	0.28	0	2
Canned	91.5	0.42	0	1
Cabbage				
Raw	91.8	1.76	38	42
Processed				
Dehydrated, raw	1.2	2.62	450	457
Dehydrated, precooked	2.4	2.31	361	378
Irradiated after enzyme-inactivation	92.1	0.56	0	28
Irradiated, precooked	92.4	0.53	0	23
As eaten				
Dehydrated, raw	88.0*	0.22	26	29
Dehydrated, precooked	86.9	0.19	27	25
Irradiated after enzyme-inactivation	91.9*	0.05	0	2
Irradiated, precooked	92.2	0.06	0	10
Carrots				
Raw	87.2	16.5	6	6
Processed				
Dehydrated, raw	3.5	133.2	29	32
Dehydrated, precooked	4.0	132.5	26	36
Irradiated after enzyme-inactivation	86.3	15.4	0	5
Irradiated, precooked	86.6	15.6	0	5
Canned	90.8	13.2	1	2
As eaten				
Dehydrated, raw	85.5	30.8	1	2
Dehydrated, precooked	85.0	30.0	1	2
Irradiated after enzyme-inactivation	86.4	17.8	1	3
Irradiated, precooked	86.7	18.2	tr	4
Canned	89.3	17.9	0	1
Corn				
Frozen, raw	68.3	0.51	9	9
Processed				
Dehydrated, raw	5.2	0.16	12	18
Dehydrated, precooked	3.8	0.19	13	16
Irradiated after enzyme-inactivation	70.2	0.27	3	3 6
Irradiated, precooked	69.7	0.18	6	6
Canned	76.2	0.32	3	4
As eaten				
Dehydrated, raw	70.8	0.32	2	6
Dehydrated, precooked	70.2	0.32	2	3
Irradiated after enzyme-inactivation	72.2	0.12	3	5
Irradiated, precooked	72.2	0.12	3	5
Canned	73.6	0.25	2	3

*To be served raw; all other items heated.

processed vegetables are given in Table 4. The aberrant nature of these data is attributed to three factors: first, limitation in the precision of the analytical method; second, the greater difficulty experienced in extracting vitamins for analysis from vegetables in the raw state; and third, the possible action of destructive enzymes in raw vegetables released during homogenization. However, others have noted increased vitamin content (10, 11).

As prepared for serving, the beta-carotene in all products studied was highest in dehydrated samples. Canned and irradiated products were competitive except in the case of corn, where the canned product was higher. There was no consistent difference between samples processed in the raw state as compared with those precooked.

STORAGE STUDY

In a companion study, the retention of vitamins during extended storage of dehydrated beef and pork was investigated, as few ration components are consumed immediately on procurement. Control samples were held at –20°F., pending analysis, and the remainder at 70°F. or 100°F. for one year.

Boneless cuts from the butt end of the loin in U.S. Good beef and from light weight loin of pork were used. Both beef steaks and pork chops were cut ½ in. thick and trimmed to ⅜ in. of fat. The steaks were frozen and freeze-dehydrated at a plate temperature of 110°F. for 48 or 24 hr., yielding products of 2 per cent (Type A) or 8 per cent (Type B) moisture. An in-package desiccant (calcium oxide) was used to reduce the moisture content of the 8 per cent sample to 2 per cent or less and to maintain the low moisture content in all samples. All pork was freeze-dehydrated to 2 per cent moisture as described above. Beef was vacuum packed in cans and flexible packages and pork in cans only. For the cooking study, steaks and chops were rehydrated by soaking for 25 min. at room temperature and each side drained for 2 min. on absorbent paper. The rehydrated meats were then panfried without added fat at 370°F. for a total time of 2½ min. and turned each ½ min. Thawed, fresh frozen samples of both meat types were similarly cooked.

Composition of the processed and prepared materials is given in Table 5. Comparisons between processed and prepared products are shown, based on equal nitrogen content in Table 6. Initially, the thiamine and niacin in beef steak was comparable to that recorded for ground beef chuck, but riboflavin was somewhat lower. No significant loss of thiamine occurred during dehydration or cooking of either fresh or dehydrated steaks. Virtually total destruction occurred on cooking ground beef. The improved performance of steaks may be due to both piece size and lower cooking temperature. There was no cooking loss of riboflavin and only a marginal loss of niacin, as reported for the ground chuck.

Since before storage there was no significant difference between beef steaks freeze-dried to 2 per cent or 8 per cent moisture content, these were treated as one product in the storage study. Thiamine, riboflavin, and niacin were completely stable during one year of storage at 70°F. or 100°F., either in cans or flexible packages.

Pork loin used in this study contained equal thiamine, but more niacin and less riboflavin than the previous sample. No loss of the three vitamins occurred during dehydration. All vitamins in the

TABLE 5 Proximate composition and content of thiamine, riboflavin, and niacin of loin pork chops and beef steaks

STATE OF SAMPLE	NUMBER OF SAMPLES	MOISTURE	FAT	PROTEIN (N x 6.25 gm.)	THIAMINE	RIBOFLAVIN	NIACIN
			Loin Pork Chops				
		←——— *gm./100 gm.* ———→			←—*mcg./100 gm.*—→		mg./100 gm.
Raw							
Fresh frozen	5	62.2 ±1.7*	16.3±1.0	20.2±0.3	100±11	133±26	7.49±0.44
Dehydrated	5	2.07±0.2	43.8±2.5	50.5±1.6	212±22	298±14	16.55±2.5
Cooked							
Fresh frozen	1	42.7†	26.0	4.71	61	150	7.4
Dehydrated, rehydrated	1	32.0	25.6	6.34	133	107	11.7
			Beef Steaks				
Raw							
Fresh frozen	5	56.2 ±2.0	26.1±1.9	17.2±0.9	49± 3	117± 9	5.12±0.79
Dehydrated (Type A)	5	1.38±0.3	56.6±2.2	40.0±2.2	105±14	257±32	10.86±1.3
Cooked							
Fresh frozen	1	42.1	33.6	3.5	58	142	4.77
Dehydrated, rehydrated (Type A)	1	34.7	33.0	4.6	73	176	6.06

*Mean and standard deviation.
†Mean.

fresh product were reduced on cooking, but only riboflavin was significantly affected in the dehydrated. No storage losses were apparent.

The storage stability of these dehydrated meats was remarkable. Previously, this laboratory showed that, of the thiamine remaining after processing of military canned meat items, 39 per cent was destroyed during one year's storage at room temperature; and 66 per cent after only six months' storage at 100°F. (12). Riboflavin and niacin retention in the canned products ranged from 90 to 100 per cent and 85 to 95 per cent respectively.

Clinical Study

The data on the moisture content of dehydrated foods as consumed show that some of the products are slightly lower than canned or freshly prepared items. This may be due to failure to reconstitute completely. It seemed advisable, therefore, to assess the digestibility of these foods and their influence on gastrointestinal irritability. Such studies were carried out under contract (13).

Three-day menu cycles were made up from a single lot of the following precooked, dehydrated foods:

Fruits and juices
- Applesauce
- Apricots
- Fruit compote
- Grapefruit juice
- Orange juice

Vegetables
- Cabbage
- Lima beans
- Mashed potatoes

Meats and entrées
- Bacon, prefried
- Beef
  - Ground, with onion gravy-and-potato hash
  - Sliced, with gravy
- Chicken
  - -and-rice casserole
  - Sliced with gravy
- Chili with meat and beans
- Macaroni and cheese
- Meat loaf with tomato gravy
- Spaghetti with meat sauce

Cereals
- Compressed cereal bar
- Macaroni
- Oatmeal
- Rice

Beverages
- Milk
- Cream
- Cocoa
- Coffee

Soups
- Chicken-rice soup
- Pea soup

Dessert—Butterscotch pudding

Hospital patients without gastrointestinal disease were provided 2800 calories daily[3]. This diet contained 112 gm. protein and 93 gm. fat. A control diet was made up from the normal hospital menu calculated to yield 105 gm. protein, 150 gm. fat, and 2800 calories. The dehydrated diet was served for six days, preceded by six days on the control diet. Urine and feces were collected daily and pooled for three-day periods. Diets, excreta, and rejected food were analyzed for nitrogen (1) and fat (14) as appropriate. Serum carotene levels were determined (15) as a further check on absorption.

[3]As proposed for military use, the daily menu yields 3400 to 3600 calories from the items listed, and, in addition, canned bread, dessert items, spreads for bread, and confections.

TABLE 6 Thiamine, riboflavin, and niacin relative to nitrogen content in loin pork chops and beef steaks during storage

STATE OF SAMPLE	NUMBER OF SAMPLES	THIAMINE	RIBOFLAVIN	NIACIN
		Loin Pork Chops*		
		mg./gm. nitrogen	*mcg./gm. nitrogen*	*mg./gm. nitrogen*
Raw				
Fresh frozen	4	0.31±0.15†	41.8±10.7	2.33±0.17
Dehydrated	4	0.26±0.14	36.8± 4.0	2.04±0.26
Cooked				
Fresh frozen	1	0.13	18	1.57
Dehydrated, rehydrated	1	0.21	17	1.84
Dehydrated, stored at 70°F.				
3 months	1	0.27	31	2.54
6 months	1	0.32	35	2.01
9 months	1	0.25	37	2.00
12 months	1	0.22	34	1.75
at 100°F.				
3 months	1	0.20	42	2.31
6 months	1	0.35	34	2.03
9 months	1	0.22	28	2.18
12 months	1	0.14	36	1.70
		Beef Steaks‡		
		mg./gm. nitrogen		
Raw				
Fresh frozen	5	17.8±2.2†	42.2± 3.7	1.85±0.25
Dehydrated				
Type A	5	16.8±3.4	41.0± 6.8	1.72±0.20
Type B	3	18#	40	1.75
Cooked				
Fresh frozen	1	17	40	1.36
Dehydrated, rehydrated, Type A	1	16	38	1.31
Dehydrated, stored				
Controls, Types A and B (−20°F.)	8	17.5±4.4	40.8±7.3	1.73±0.20
Stored at 70°F.				
Canned				
10 days	1	16	42	1.63
20 days	1	17	38	1.71
1 month	1	15	37	1.66
3 months	1	15	40	2.00
6 months	2	14	48	1.43
9 months	1	17	40	2.25
12 months	2	18	40	2.08
Packaged				
6 months	2	14	43	1.69
12 months	2	18	36	2.02
Stored at 100°F.				
Canned				
10 days	1	17	42	1.62
20 days	1	18	42	1.70
1 month	1	15	32	1.60
3 months	2	16	44	2.01
6 months	2	16	54	1.86
9 months	2	16	40	2.12
12 months	2	17	38	2.10
Packaged				
3 months	2	14	49	1.97
6 months	2	12	51	1.74
9 months	2	14	33	2.14
12 months	2	21	38	1.81

*Each sample was a composite of eight chops.
†Mean and standard deviation.
‡Each sample was a composite of seven steaks.
#Mean only.

TABLE 7 Metabolic data on hospital patients fed precooked, dehydrated foods

DATUM MEASURED	CONTROL DIET	DEHYDRATED DIET
Nitrogen (gm./day)		
Consumed	19.0	15.9
Urinary	14.6	11.5
Fecal	1.0	1.1
Balance	+3.4	+3.3
Apparent protein digestibility (%)	95	93
Fat (gm./day)		
Consumed	165.1	66.4
Fecal	4.9	2.4
Apparent fat digestibility (%)	97	96
Serum catotene (mcg./100 ml.)	153	171
Body weight (lb.)	183	184

were available. No differences between the dehydrated and control diets were apparent with respect to nitrogen balance, protein and fat digestibility, or serum carotene, and consumption was sufficient to maintain body weight. Such clinical events as occurred were not considered to be related to consumption of the dehydrated diet. The investigators reported: "Confirmation of the absence of induced irritability of the gastrointestinal tract during the period of study of the dehydrated foods was obtained by barium meal studies. The barium meals were given to subjects before and after the dehydrated food diet. Serial roentgenographic films were taken at ½-hr., 1-hr., and 2-hr. periods. There was no significant change in the appearance of the barium column or in the rate of passage through the stomach and small intestine after having been on the dehydrated food diet. Emptying of the stomach and motility of the small intestine were within normal limits. The normal continuity of the barium column and the normal mucosal pattern of the jejunum and ileum were preserved."

Finally, these foods have been tested under field conditions. Military personnel engaged in strenuous activity in a cold climate were issued 1⅓ rations per man per day, the dehydrated ration being compared with conventional canned rations (16). Intake was 4114 calories per day from the new ration and 4267 calories from the Combat Ration. There were no signficant changes in body weight, indicating that intake kept pace with expenditure during the six-week test period.

Summary

A comparison has been made of the nutrient content of various animal and vegetable products before and after dehydration, irradiation, and the conventional thermal processing. Data have also been presented on the effect of storage on dehydrated meat products, as well as the digestibility of dehydrated foods and certain functional characteristics.

In general, the results indicate that, among the methods and products studied, nutrient content is affected least by dehydration. Excellent vitamin stability was noted during storage of dried meats. No differences between dehydrated and normal foods were seen with respect to digestibility or support of nitrogen balance and body weight in man, nor were they noted to alter gastrointestinal irritability.

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The Nutritive Adequacy of Our Food Supply[1]

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MANY CONSUMERS are concerned today regarding the safety and nutritive value of our foods. They want to know if the chemicals used in growing, processing, and packaging our food supply are harmless. They want to know whether modern methods of processing rob foods of their nutritional properties. And, they want to know whether there is a basis for the sensational charges made by nutritional cultists and promoters who are selling the "health foods" and the diet books.

Americans seem to be eating very well these days —at least I have not noticed that efforts to promote "dietary hypochondria" have cut down on food consumption. It does seem to me, however, that there is a need to answer these questions for the benefit of consumers who sincerely want to know whether the foods available in our stores are healthful and nutritionally adequate.

Why are these questions being asked? The basic reason, in my opinion, is that there has been a revolution in agriculture and food technology during the past century and especially in the last twenty-five years. The public food supply, particularly in the United States, is being grown, stored, processed, and packed in new ways, and with the aid of new materials that have been scientifically developed for a host of purposes. At the same time, new knowledge of nutritional science has made it possible not only to discover dietary deficiencies, but how to prevent such deficiencies. We have seen the development of new methods of food preservation and food enrichment, but we have also seen the growth of nutrition nonsense and quackery which thrives on promoting mistrust of our abundant food supply. Unfortunately, new scientific advances in the health field always seem to provide opportunities for misrepresentation and quackery. Unfortunately, too, the food industries have neglected the job of informing consumers adequately regarding technologic changes in manufactured food products.

Nevertheless, food chemistry and food chemicals are here to stay. The population of this country and the world certainly cannot be fed today without the use of chemical aids in planting, growing, harvesting, and processing our crops.

The Chemical Contamination of Foods

Although its dangers are greatly exaggerated by alarmists, the use of chemicals in the food supply *does* create serious public health problems. This arises from the large number of chemical materials which are now employed in food production, and from the ever-present possibility that some serious mistake may occur. It is important, therefore, that there be an adequate public understanding of the problem, based on reliable information. Dietitians, especially, need to know the answers to the questions that consumers and patients are asking.

All of us today are aware that an ever-increasing number of chemical substances used in and on foods requires constant vigilance and testing to assure that the public is protected. With the recent passage of the Food Additives Amendment, the Food and Drug Administration *is now able for the first time to require that all substances used in food be proved safe under the conditions of proposed use.* But we are finding that this job is bigger than we at first supposed, because the number of these materials is actually much greater than any of the previous estimates. Today about seven hundred food chemicals have been exempted from further testing under the food additive law because, in our opinion, they are generally recognized as safe. At the same time, about three thousand temporary clearances, or time extensions, have been given to various kinds of chemicals which are probably safe but which in some instances may require further scientific testing to insure this fact. This does not mean that there are over three thousand chemicals in this category; the number is less because some of them

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 19, 1960.

represent different uses for the same materials. These figures, by the way, do not include the agricultural chemicals, such as insecticides, weed killers, and the like, which are controlled under the Pesticide Amendment passed in 1954.

How may chemicals get into our food supply? There appear to be four stages in food production where this may occur: first, from the soil or fertilizer used in growing crops; second, from pesticide chemicals applied to the crops; third, from drugs administered to livestock; fourth, chemicals added during food processing, or which may get in from the package.

Fertilizers

There is no evidence that fertilizers, whether of the "natural" or "chemical" variety, have any deleterious effects on our food supply. Specifically, there is no evidence that they are a source of unwanted chemicals in food, or that they have any significant effect on the nutritional value of foods. Their effect is to increase the yield and quality of crops, apart from their nutritional value. I will have more to say about this later.

Pesticides

A more obvious source of unwanted chemicals in food comes from the use of pesticides. One of the paradoxes of modern living is the necessity of using poisons to protect our crops from destruction by insects and other pests. We have learned how to do this effectively, and safely. Without the use of pesticides, the food available to the people of this country would be neither as varied nor as economical as it is today. But many of the chemicals used to combat insects, weeds, plant disease, and so on, are toxic to man if inhaled, absorbed, or ingested in sufficiently high concentrations.

To deal better with this problem, Congress in 1954 enacted the Pesticide Chemicals Amendment, under which an agricultural poison licensed by the Department of Agriculture is eligible for establishment of a safe residue tolerance by the Department of Health, Education and Welfare. If the Department of Agriculture, on receiving the data submitted, believes that a residue will remain on food crops, then the matter is referred to the Food and Drug Administration to determine whether the residue is harmless or whether a safe limit or tolerance must be imposed. It then becomes the responsibility of the individual using such an agricultural chemical to follow the recommended methods of application. We know from experience that this is not always done. Constant educational effort is needed to stress the importance of following label directions.

Likewise, constant vigilance and adequate manpower are needed to check the safety of raw agricultural commodities by testing samples for pesticide residues. I am glad to report that our market surveys show that the incidence of excessive spray residues on fruits, vegetables, and other crops is very small in comparison with the vast number of shipments that are entirely free of such contamination, or well within the legal tolerance. Nevertheless, much more inspection and testing is needed in this field to protect consumers adequately.

Frequently we are asked if it is necessary to wash fresh fruit and vegetables as they come from the store. Our reply is that such washing is always a good practice but should not be necessary for the removal of spray residues.

Drugs Administered to Livestock

Since 1938, the Food and Drug Administration has had authority to prevent the marketing of any drug for use in livestock and poultry if such use is not recognized as safe for the human consumer of the meat or other products from such livestock or poultry. Many veterinary drugs have been cleared as safe under the "new drug" section of the law. Some of them have tremendous value for the economical production of such important foods as meat, milk, and eggs. There have been few instances in which it has been necessary to invoke the law to protect public health in this field. Actually, by requiring pre-distribution clearance of new drugs, the law prevents violations.

You will recall that in 1959 the Department took action to stop the use of stilbestrol, a hormone-like drug, in raising poultry because residues had been detected by new tests in the skin, livers, and kidneys of the treated birds. Poultry raisers promptly discontinued the use of the chemical, and drug firms stopped selling it for use in poultry. Three firms, however, are contesting the Department's action and contend there is no danger to public health from stilbestrol-treated poultry. The Department's position is that since stilbestrol is known to be capable of causing cancer, no chances should be taken. Furthermore, the new Food Additive Amendment contains a clear prohibition of any cancer-inciting chemical in food.

Food Additives

The processing and packaging of the many convenience foods we know today would be impossible without the use of chemicals such as preservatives, anti-oxidants, stabilizers, thickeners, bleaching agents, buffers, colors, sweeteners, nutrient supplements, flavors, and spices. Before the advent of the Food Additives Amendment of 1958, the Food and Drug Administration could not proceed against a substance used in food unless we could prove that the substance was actually harmful.

The Food Additives Amendment shifts the burden of proof to the manufacturer, who must now furnish evidence that the substance he wishes to use will

be safe under the proposed conditions of use. This may involve several years of testing on laboratory animals. Some leading manufacturers have been doing this kind of testing for years. Now, however, *all* must provide the Food and Drug Administration with proof of safety of any substance which they intend to use if it has not previously been found safe. The decision as to whether a food additive is safe rests with the scientists of the Food and Drug Administration. To food manufacturers, it may seem at times that progress is being delayed by these new requirements, but it should be remembered that when the health of the American people is involved, it is prudent to err on the side of caution.

The Food Additives Amendment is one of the most important safeguards of the public health today. It assures that chemicals must not only be safe before being used in foods, but must also serve a purpose and not be deceptive to the consumer. In others words, chemicals must not be used to make inferior foods appear similar to good foods.

The new law also prohibits the addition to food of any amount of a substance that is shown to be capable of causing cancer in man or animals. According to the best medical opinion available today, we do not have sufficient knowledge to establish a safe level of use for a cancer-producing chemical.

Many important new problems have arisen in connection with the Food Additives Amendment, but we believe that with experience and time they will be solved. There is an immense backlog of research to be done regarding food materials that have not been adequately studied. Industry and government scientists have just begun to make inroads on this backlog.

The Nutritive Adequacy of the Food Supply

The Food and Drug Administration regards the protection of the nutritive quality of food as one of its vital responsibilities. Many questions are being raised today by the uninformed and the misinformed concerning the nutritive adequacy of the daily diet. Some consumers seem to have the impression that all food processing and food preservation is injurious. The "natural" food cult has attempted to foster the belief that anything subjected to processing is "devitalized," if not actually harmful.

Dietitians, of course, are experts in this field and know what the facts really are. However, for the record I will briefly summarize them.

It is well known that some methods of food processing remove some of the essential vitamins and minerals. Some of the most important nutritional discoveries have been made because of this fact. Less well known is the fact that modern methods of food processing have been developed to protect the nutritive content of most of our staple foods. For example, by using the most modern procedures and growing special varieties of crops that are harvested at just the right time, the modern canner packs a product that is of high nutritional quality. To illustrate, the canned or frozen orange juice of today retains up to 98 per cent of the ascorbic acid present in unprocessed oranges.

The "Organic" Cult

There is a small but rather militant group in this country who are advocates of so-called "natural organic" foods, and who contend that the use of chemicals has the effect of "devitalizing" our soils and producing food of inferior nutritive properties. These ideas, of course, are actively promoted and exploited by people who are in the business of selling the so-called "natural" foods. Such products are claimed to have been grown "organically," that is, without the use of any chemical fertilizers or pesticides, and processed without the use of food additives. We suspect that there are not many true "natural organic" foods. People who buy such products are paying fancy prices for imaginary properties and benefits. Unless you have seen some of the material published by the organic cult, I do not think you can fully realize the extent and insidiousness of their promotional effort.

On the other hand, an examination of the *scientific* literature does not reveal any convincing support for the organic food cultists—quite the contrary. The nutritional composition of foods is not significantly affected by the kind of fertilizer used on the crops. For example, in controlled experiments performed at the U. S. Plant, Soil and Nutrition Laboratories at Ithaca, New York, it was found that the ascorbic acid and carotene content of seedling rye grown on soil that had received large quantities of manure over a period of twenty-five years was the same as that of rye grown on soil fertilized with chemical fertilizer for the same period. Also, the ascorbic acid, iron, and copper content was the same in potatoes grown on the "naturally fertilized" soil and those grown on the "chemically fertilized" soil (1). Maynard, in 1956, reported (2) that fertilizing the soil influences the *yield* of the food grown on it rather than significantly influencing the nutritive content.

The national food enrichment program is another important factor in the nutritive adequacy of the food supply. Under this program, essential vitamins and minerals are added in scientifically determined amounts to staple foods which are suitable vehicles for these important food components. The Food and Drug Administration assists through enforcement of its food standard regulations.

The great variety of the American diet also serves to insure its nutritional adequacy. The food supply

available to our population today provides nutrients in excess of the dietary allowances recommended by the National Research Council for optimum nutrition of every man, woman, and child. As an example, the average intake of protein is more than twice that actually needed. Yet we are being subjected to a barrage of promotion exhorting us to eat certain products because of their protein content, with the implication that many people suffer from protein malnutrition.

It should be recognized, of course, that certain areas and population groups may have special nutritional problems, but the solution to this is better education in the selection of foods. Dietitians can say without hesitation that the average American who chooses a balanced variety of foods has no need to worry about being adequately nourished.

Food Quackery—A National Delusion

The American food supply is the most abundant and nutritious the world has ever seen. Yet we find on the market today an infinite variety of special dietary foods and vitamin mixtures of every description. The American Medical Association has estimated that the public wastes about $500 million a year on nutritional nostrums. We think this a reasonable estimate.

What can dietitians do to promote rational nutrition and discourage nutritional nonsense?

You have already done a great deal. Through your programs of nutrition education, you are one of the leading sources of sound information in this field. But there is much more to be done.

For example, your patients, students, and the public should be advised to view with suspicion any special dietary food that is claimed to have unusual vitamin and mineral content because it contains more ingredients and greater potency than are necessary to meet recommended dietary requirements. There are hundreds of "shot-gun" food supplement formulas on the market. We seized a product recently which had 104 ingredients in a two-pill combination, with a so-called "cornucopia base" of 68 fruit and vegetable extracts. The only purpose of such weird and ridiculous concoctions is to impress and deceive the ignorant.

One of the best-selling vitamin products sold house-to-house contains eighteen times as much thiamine as the recommended allowance for adults. Again, the only purpose is to impress the gullible. There are hundreds of such formulas which are "loaded" with excessive and unnecessary quantities of vitamins. They are promoted on the basis of the common fallacy that if a little of something is good for one, then more would be that much better.

There is a fundamental popular misconception of the role of vitamins in the diet. Many people seem to believe that any shortcoming in the food intake can be made up by taking some kind of pill. They do not realize that vitamins are not a substitute for food but enable the body to utilize food properly. Good nutrition is impossible without good and sufficient food. *With* such a diet, most persons have no need for added vitamins.

Many vitamin promoters in their literature compare the amount of nutrients provided by their products with the content of well known foods. This is a basically deceptive comparison. To illustrate, one claimed that his food supplement contained as much Vitamin A as 3½ qt. milk; as much thiamine as 8 lb. roast beef; as much ascorbic acid as 7½ apples; and as much B_6 as 150 eggs. A consumer gets the impression that he can become "supercharged" by taking such a wonderful concoction. He is *not* told that he gets these vitamins from other foods and that ordinary average servings of such foods as meat, milk, vegetables and enriched bread will supply all nutritional requirements.

According to the Council on Foods and Nutrition of the American Medical Association, multiple vitamin preparations should contain only those vitamins or minerals which are necessary in human nutrition. Many nutrition authorities agree that only about a dozen vitamins and minerals have a place in a food supplement. The weird concoctions sold today as dietary supplements are inherently deceptive.

Thus far I have said nothing about the fantastic cure-all claims that are made for many of these so-called dietary supplements. Truly they are the modern version of "snake oil," good for every ailment that afflicts the race of man. Recently we instituted criminal proceedings against a promoter on charges of misbranding by false claims to prevent or cure disease. Over two hundred false claims were made in the literature promoting this one product.

No doubt you have heard of the book *Folk Medicine*, (3), which recommends apple cider vinegar and unpasteurized honey for some sixty different ailments from heart attacks to falling hair. Since this book continues to be a best-seller, it seems likely that at least some of its readers are relying on its recommendations of honey or vinegar to prevent or treat serious disease. Neither of these foods have any significant therapeutic value. Self-medication on the basis of such advice can be extremely dangerous, especially to a person who has any serious ailment.

No court action is possible under the law against the *publishing* of such medical folk-lore, harmful as it may be. But, when a mixture of honey and vinegar was put on the market, with the book tied in as promotional material, we were able to seize the product and the book, where they were displayed together[2].

[2]Twice the Food and Drug Administration has seized a product named "Honegar," a combination of honey

During the past year, the Food and Drug Administration has carried on a vigorous law enforcement campaign against all kinds of false claims for special dietary products. We have had thirty-one completed court actions, including twenty-five seizures and six criminal prosecutions. Now pending in the courts are forty-three additional seizures and two criminal prosecutions. We seized the entire warehouse inventory of two of the largest mail order vitamin companies, because of false claims in their catalogues. One made claims for forty-nine different diseases and conditions; the other named twenty-six. A big pharmaceutical company had twenty-seven unwarranted claims in its brochure. The value of the seized goods was over $1½ million. But this, of course, is only a small part of the total "take" of the nutrition racket.

A large segment of the public is being exposed to the misleading information disseminated by faddists and unscrupulous promoters. To be armed against their false statements and implications, the consumer needs unbiased, authoritative information about diet. "Food for Fitness," the daily food guide published by the Department of Agriculture (4), is an excellent example of the kind of educational material that needs to be widely distributed.

Consumers also need to be better informed about the function of vitamins in the ordinary diet and the limitations of vitamin preparations and food supplements in treating and preventing disease. There is a continuing need to debunk the false promises of the vitamin peddlers and pitchmen. I know of nothing better for this purpose than the motion picture which the American Medical Association has produced, called "The Medicine Man." It should be shown widely, to schools, organizations, and on television.

The Food and Drug Administration has a circular called "Food Facts vs. Food Fallacies" (5), which outlines claims and practices which violate the Federal Food, Drug and Cosmetic Act. We will be glad to send it to any dietitian or teacher.

Over the years, dietitians have made a very important contribution to public health by teaching rational nutrition and exposing hokum and pseudoscience wherever it appears. We welcome and applaud your efforts and hope you can increase them.

A continuous effort is necessary to keep the record straight regarding the wholesomeness, safety, and nutritional quality of the American food supply. There is, unfortunately, a vast fund of public *mis*information on these subjects that is like money in the bank for the unscrupulous promoter. To boost his sales he seeks to undermine public confidence in our staple foods and to encourage self-medication for conditions that call for the attention of a physician. Ailing, elderly, and retired persons on limited incomes are his special victims. But the young family must also be on guard because there is not money enough in the food budget for expensive supplements that are not needed.

The false premises on which some promoters base their pitch must not go unchallenged. The statement that any common disease of the American public is due to inadequate diet is *false*. There are many causes of disease, and the advice of a competent physician is necessary to determine specific deficiencies and to prescribe for them.

Foods available in any modern food store today supply the nutritional needs of the average person. Our food supply *is* being protected against chemical contamination.

There is no need to go in for food fads and freak diets. It is *not* necessary for the average person to supplement his diet with vitamins and minerals to protect his health. And particularly, the public should reject any suggestion of unsupervised self-treatment with vitamins or minerals to cure disease.

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(3) JARVIS, D. C.: Folk Medicine. N. Y.: Henry Holt & Co., 1958.
(4) Food for Fitness. USDA Leaflet 424, 1958.
(5) Food Facts vs. Food Fallacies. Washington, D.C.: Food and Drug Admin., 1958.

and vinegar (see July 1960 JOURNAL, page 31, and January 1961 issue, p. 31). In the first seizure, the promoter of the product referred in his sales literature to the book, *Folk Medicine*. In the second seizure, the product was displayed in close proximity to the book. The first seizure was made on the basis that the label failed to bear "adequate directions for use," while in the second instance, it was alleged that the book constituted false and misleading labeling of the product.

The Health Occupations

One out of every thirty employed persons in the U.S. now works in the "health service industries"—a total of 2½ million people—according to the Health Information Foundation. "The 1960 Census may very well show that within the last decade, the health field has risen from seventh to third place among major U.S. industries in terms of numbers of persons employed." In 1940, 7.8 persons per 1000 population earned their living in this field, while for 1960, the estimated comparable figure was 13.9. About three-fifths of these persons are connected with hospitals or related institutions.

Better Business Bureaus Fight Food Faddism[1]

MARSHALL A. MOTT

President,
Cleveland Better Business Bureau

BETTER BUSINESS BUREAUS are non-profit organizations first established by business in 1912 to protect both the public and business from advertising and selling practices which are misleading, deceptive, false, or fraudulent. Through the Association of Better Business Bureaus—the name is controlled by trademark and copyright—all recognized Bureau organizations work toward a common goal. Today, this network, covering most of the major communities of the United States and Canada, has some 115 such affiliated Bureaus to which Mexico City and Caracas, Venezuela have been added recently. Additionally, there is a National Better Business Bureau working in the areas of national advertising and taking leadership on behalf of all Bureaus in many areas and particularly in the fields of foods, drugs, and cosmetics. Local Better Business Bureaus are supported primarily by local business. The National Better Business Bureau is financed by national business firms and organizations. Although each Better Business Bureau is wholly autonomous, activities are coordinated through the Association of Better Business Bureaus. Our service to the public is entirely free.

The efforts of Better Business Bureaus in the field of combating food misinformation, as well as in other fields, can perhaps best be described as preventive, corrective, and educational. Ideally the best way to protect the public from false or misleading advertising is to prevent the appearance of such advertising. While we recognize that this is a goal which will in all probability never be entirely accomplished, there are a number of ways by which this protection can be made effective. As an example, the National Better Business Bureau publishes an extensive looseleaf volume entitled "Do's and Don'ts in Advertising Copy" for use by advertisers, advertising agencies, media, and others concerned with the preparation and acceptance of advertising. Through the Association of Better Business Bureaus, another publication, *Guide for Advertising and Selling*, is used extensively on a local level and is kept current by a standing committee.

Methods of Operation

Over the years, Bureaus generally have had considerable experience in many parts of the country with food faddists, health food lecturers, cancer cures, obesity remedies, and even the peddling of pots and pans. Working closely with the American Medical Association, the Food and Drug Administration, the Federal Trade Commission, and other interested organizations and professional societies, thousands of persons have been saved from wasting hard earned dollars and other thousands have been steered away from treatments, remedies, diets, and so on, which were actually injurious to health. Bureau information is invaluable to other organizations and law enforcement agencies because we have the confidence of the consumer as impartial fact-finding organizations. Each year several hundred thousand of these consumers report their experiences to us and provide specific information on which conclusions can be drawn and action taken.

It is not a Bureau function to act as experts in nutrition or pass upon the value of foods or on the multitudinous programs promoted by many individuals and groups. Rather, our function is to make every effort to be sure that facts are presented in a truthful, understandable, and believable manner. In short, Better Business Bureaus provide a wealth of information on specific subjects and individuals, most of it developed from the customers' reported experiences. Additionally, great effort is expended to develop information about individuals and promoters to provide a concise picture of their activities, backgrounds, and business records.

All of this is available for the asking. As evidence that it is used, the record shows that more than two million people contact Better Business Bureaus each year for information. By far the largest proportion of these contacts are from persons who are seeking such service prior to spending their money or doing business with firms and individuals.

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 18, 1960.

Medical Quackery

The Bureau in Cleveland, we believe, has had more experience than most communities in the general area of special interest to dietitians because of our close working relationship with the Academy of Medicine and other professional groups. During the past ten years, we have concentrated on medical fakes, self-styled nutritionists, food faddists, and pure quacks, as well as unlicensed practitioners, limited practitioners, and downright frauds who prey on public gullibility.

Several years ago, for example, an extensive investigation was made of a local doctor conducting a so-called clinic where "diagnostic" machines were used. An investigator, posing as a patient, was examined with a diagnostic machine and had, in addition, a so-called electrical examination of her spine. The report stated that she was filled with aluminum, arsenic, and strychnine. She was promptly advised to throw away all of her aluminum ware to avoid further poisoning of her system.

In another situation, the psuedo patient was advised that her body contained sufficient lead arsenic that if she were to die suddenly and be taken to the morgue for an autopsy, one of her best friends might be accused of murdering her. This particular patient was advised never to take baths or showers but to limit herself to sponge baths and to wash certain vegetables in trade-name detergent. Of course, she was given several envelopes of pills to be taken at intervals. The charge, incidentally, was $35.

Another patient was placed on a drop bed by the doctor—and he was an M.D.—who operated a diagnostic machine. One test was that of placing a piece of dried up grapefruit on the machine. After the flashing of lights, the patient was told that grapefruit could be consumed without ill effect. As a matter of fact, this machine was so effective that it was said to diagnose the safety, for the patient, of his brand of cigarettes. To determine the type of pills which this patient should take, several of a number of varieties were prescribed after being placed on the machine. Those which reacted favorably through the wires attached to the patient showed on colored lights. The finale was the prescribing of twenty pills per day to be taken between 2:00 a.m. and 2:00 p.m. Interestingly, the tablets were labeled as containing such varied ingredients as ox bile, dandelions, asparagus, potato peels, powdered cabbage, and alfalfa. And, the doctor warned him to burn sulphur in his house at least once a day to absorb the arsenic and purify the air.

Food Quackery

Then there was the man-and-wife team described in a Cleveland newspaper article as "America's only kitchenware sales team in evening dress." An audience of 750 people were promised perfect health, sex appeal, and miraculous cures through dieting. Until the husband stumbled on the secret of correct eating —as he put it—he had been stone blind and had baffled eighty-seven specialists. Referring to doctors in general, he said, "It's good business to keep you a little sick all the time." At the same time, as the news article said, his wife "alternated at showing off one of her 'French import' gowns and a counter full of horrible-example foodstuffs, including citrus fruit, milk, flour, meat and anything canned or frozen."

As Kenneth Milstead of the Food and Drug Administration said recently, "Quackery is not new. It has been with us since ancient times. It will continue to be with us because it feeds and grows on powerful incentives of human nature, the desire for health, the fear of pain, disease and death, the desire to make easy money and the desire to save money even at the risk of health."

A much more difficult area in Bureau activities is that of the food faddists. In our experience—and it has been considerable over the past twelve years—it is not so much *what* they say as *how* they say it. When you read rather than hear, the words in themselves are not usually mis-statements. Yet, when declaimed with oratorical gymnastics and the use of props, the implications and insinuations are far different. In situations of this sort, it is difficult for media, although sympathetic and understanding, to take an arbitrary stand without substantial evidence to back them up. It is at this point that the Bureau seeks assistance from the medical profession, nutritionists, dietitians, and others. Unfortunately, the information furnished is too often such that it cannot be used publicly.

The Better Business Bureau has, I believe, the confidence of both business and the public. It is in this position solely because it insists on facts. It cannot widely disseminate with safety opinions or a casual dismissal of a product or a cult as being unbelievable and silly to one of average intelligence. In fact, over the years, it has been truly amazing to listen to the stories and observe the convictions of persons otherwise extremely intelligent.

In summary, then, Better Business Bureaus are organizations of business, supported by business, and primarily interested in the protection of the public and the market of legitimate business. Through its close working relationship with media and through the circulation of its own publications, it is always ready and willing to accept the responsibility of disseminating factual information and to attack or expose those who mislead or are perpetrating frauds. But let me reiterate that we are not experts in one or all fields and we need your help and counsel. We must depend on you for substantial factual information. Then we can move ahead.

Nutrition Education via the Public Press

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In April 1960, we began an experiment in nutrition education by means of a syndicated newspaper column, called "Food and Your Health." A long-standing concern about the need for additional tools for teaching basic concepts of nutrition to the average citizen was chiefly responsible for the decision to try this approach.

The column has evolved gradually from a variety of experiences, including the writing of a weekly column for a year for a small town New York State paper, several articles in popular magazines, talks to "lay" groups, and our daily mail. It is still in the "beginning" stage, although now, at the end of a year of syndication, about thirty-five newspapers across the country carry it twice a week.

The "format" or publication pattern has been fairly well established on the basis of a four-week cycle, consisting of eight articles. One column is usually a quiz; one deals with dietary problems; one is of a public health nutrition nature; one is on an aspect of global nutrition; and four provide answers to questions received from readers. We do *not* "make up" the questions.

Readers' Correspondence

So far, readers' responses have been gratifying and have confirmed that the American public is confused but very *positively* interested in foods and their role in nutrition. Letters, averaging about a hundred a month, fall in the following broad categories:

(a) Requests for information on the role or need for specific nutrients.

(b) Requests for methods of reducing or gaining weight.

(c) Inquiries about dietary modifications.

(d) Requests for information on feeding of children and oldsters.

(e) Inquiries concerning the safety of foods, particularly with regard to additives and preservatives.

(f) Questions about highly advertised "wonder" foods and supplements.

(g) Protests from faddists about stands taken in the column on such issues as fluoridation, "organically grown" foods, whole wheat vs. white enriched bread, and so on.

About 75 per cent of the "fan mail" has fallen in the first four categories; 15 per cent in the next two; and 10 per cent in the last.

We sort the letters, take the questions we can use in the column, and send form postcards to the writers thanking them for their interest. If a correspondent has an urgent but individual problem, we reply personally, either answering the question or referring him to a source of help. For example, a number of people have written us who have been placed on complicated dietary programs by their physicians, without much assistance in meal planning to carry out the programs. We advise the writers to ask their physicians to send them to a dietitian in the area. Letters from obvious "crackpots" are ignored.

Many people want sources of information—books, pamphlets, and booklets. We have compiled a short list which we send to such people.

Producing the Column

Producing a column has required some re-education in writing techniques for us. The usual professional method of proceeding from an introduction through history to method and finally to conclusions is *not* the way to write a column. We have learned to put the last sentence first, the last paragraph first, and to use *one* word—a simple one if possible—for every ten we normally indulge in. We have discovered that one does not write continued stories for columns.

Then there is the matter of schedules. There must be schedule; yet, it must be flexible enough to allow for interruptions. Current events need to be spotlighted while they are current.

One must also be alert to column possibilities. With our supply of readers' letters to draw from, subject matter for the quizzes and the question-and-answer columns is not difficult to find. For the rest, our own experiences and current literature help.

Perhaps our biggest problems are to know what, from the viewpoint of our co-professional friends,

is good or poor, how to improve, and the subjects they would like to see presented. We have no doubt about what our opponents—the faddists, the cultists, and the devotees of "nature" foods—think. They are most vocal in writing to the newspaper editors, as well as to us. We assume that if a "debunking" statement by us arouses a flurry of protests, there is a need for further enlightenment on the subject.

Of course, newspapers pay for the articles. The money that comes to us is placed in a special fund given to Harvard's Department of Nutrition.

If this attempt should prove a valuable vehicle for public information and if it continues to meet with reader interest, we shall feel that it is an effort well worth while.

EDITOR'S NOTE: If you have seen the column of your local newspapers and think it worth while, why not give it support by writing to the editor of the paper? Such letters help to counteract the very vocal faddists who are well known for their profusion of letters. If your local paper does not carry the column, you might suggest to the editor that the column be added to the editorial offerings of his paper. The column is syndicated by Adcox Associates, 821 Market Street, San Francisco.

BIOGRAPHICAL NOTES FROM THE HISTORY OF NUTRITION
James Somerville McLester—January 25, 1877–February 8, 1954

James S. McLester M.D., the author of *Nutrition and Diet in Health and Disease,* and for twenty years Chairman of the American Medical Association's Council on Food and Nutrition will long be remembered as one of the outstanding medical men of this century who early recognized the importance of nutrition. Possibly his interest in nutrition arose from his studies (1907-08) in Germany when he took courses in physiologic chemistry in Berlin and Munich. Possibly he saw cases of pellagra in his medical practice; certainly, he was starting his medical career just when nutrition was beginning to emerge as a science.

James Somerville McLester was born January 25, 1877 in Tuscaloosa, Alabama. He was the first born, and only son of Joseph and Anna Maria (Somerville) McLester. His father came from Scotland and was a banker in Tuscaloosa; when James was six years old, the family moved to Birmingham. At the age of fifteen, he entered the University of Alabama (1892-96) and took the classical course. After receiving his degree, he went to the University of Virginia Medical School and received his M.D. degree in June 1899. This was followed by one year of internship (1900) and a year as resident physician (1902) at Philadelphia Polyclinic, with an intervening year of study of pathology (1901) at Gottingen and Freiburg, Germany.

In 1902, McLester returned to Birmingham and started medical practice; after his later year in Germany (1907-08), he set up his own clinical laboratory and at first did his own tests and laboratory work. In World War I, he served with the Medical Corps here and overseas and gained the rank of Colonel. When the second World War came, he was a member of the Food and Nutrition Board of the National Research Council and Chairman of its Subcommittee on Medical Nutrition and helped in the development of the K ration.

Dr. McLester was Medical Director of the schools of Birmingham for forty-five years. He urged nutrition education for pupils, teachers, and parents because he believed as he wrote "that in childhood even the development of character proceeds more surely in the presence of health and that good nutrition is prerequisite to health"; and he encouraged the development of the school lunch program. He repeatedly emphasized the importance of diet in the treatment of disease and the need for physicians to know nutrition. To this end he wrote his textbook on nutrition which has gone through six editions, the first appearing in 1927.

In recognition of his contributions in clinical nutrition, the American Medical Association in 1953 awarded him the Goldberger Award; the Association of Military Surgeons has named its annual award for him; and the Alabama Academy of General Practice has established an annual lectureship in his honor.

Dr. McLester gave himself completely to his profession and had little interest in small talk or in hobbies except reading—history and biography being his favorites. He was Professor of Medicine in the Medical College of Alabama, 1920-50, and the University awarded him an honorary Doctor of Laws degree in 1929. Always he sought for excellence; for his students he wanted, and taught facts and also insisted on a broad general cultural program. He was a busy man but always willing to take time to talk to home economics nutrition classes or dietitians. He was elected President of the American Medical Association (1935-36) and was also a Fellow and Past-Regent of the American College of Physicians.

In 1903, Dr. McLester married Ada Bowron. They had three daughters and a son who is now in charge of the student health services of the University of Alabama. Dr. McLester was tender and affectionate to his family, and to his associates he offered warm friendship.

In 1951, Dr. McLester suffered a cerebral thrombosis and died February 8, 1954.

REFERENCES: Wilder, R. M.: James Somerville McLester: 1877-1954. Science 120: 242, 1954; Carmichael, E. B.: unpublished paper.—*Contributed by E. Neige Todhunter, Ph.D., Dean, School of Home Economics, University of Alabama, Tuscaloosa.*

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Shipibo mother preparing pottery. Note the ball of clay, the formed bowl, and the fire-finished and painted bowl. The reader can also observe the flattened head of the nursing infant.

I. The Shipibo (Monkey People)

Diet and Food Beliefs of Peruvian Jungle Tribes[1]

THE SHIPIBO (monkey people) live in the Amazon Basin along a 400-mi. stretch of the Ucayali River from the Island of Puinahua to Bolognesi. The tribal population is estimated at 12,000 (1), including the Conibo tribe (eel people) who speak the same language and share the same culture.

The Shipibo are endogamous, maintain their own language (which is one of the Pano languages), and have their own distinctive dress. The women wear wrap-around skirts woven from tree cotton and embroidered with intricate geometric designs. Their Spanish gypsy blouses, introduced by early religious missions, leave the midriff bare. Hair is cut in bangs, and faces are sometimes painted in geometric designs with vegetable dyes. The ornaments they wear are made from silver or nickel coins which hang from the nasal septum or from a hole punctured through the lower lip. During the first six months of life, the children's heads are flattened with a special head board for cosmetic reasons. The Shipibo are well known for their pottery, which is considered excellent from the standpoint of both design and quality. It is made without benefit of wheel or oven. They live in huts with thatched roofs and no side walls. Sometimes the floor is a raised bark platform about 3 ft. from the ground, otherwise there is none. The women cook over a wood fire laid on the ground; sometimes a high rack is constructed near the fire to keep the earthen cooking utensils out of reach of children and dogs.

Food Supply

The food supply is obtained about equally from subsistence farming and hunting and fishing.

In small plots near the village, the Shipibo cultivate plantain, yuca (cassava, manioc), sweet potato, squash, corn, peanuts, the tubers ashipa and sachapapa *(Dioscorea trifida)*[4]; also elephant ear *(Colocasia esculenta)*, daledale *(Dioscorea sp.)*, watermelon, orange, mango, pineapple, zapote *(Matisia cordata)*, pacae *(Inga feuillei)*, caimito *(Lucuma caimito)*, and taperibá *(Spondias mombin)*.

They also gather foods from the jungle. Among these are the fruits, annona *(Annona squamosa)*, quinilla, srësron, aguaje *(Mauritia flexuosa)*, pijuayo *(Guilielma gasipaes)*, and a palm nut, shebón.

The people in this tribe hunt deer, peccary (both *Pecari tajacu* and *Tayassu pecari)*, agouti *(Dasprocta aguti)*, majás *(Cuniculus poca)*, turtle *(Podocnemis expansa, Testudo tabulata,)* and their eggs—also armadillo *(Dasypus novemcinctus)*,

[1]Received for publication October 17, 1960.

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[3]Linguist, Summer Institute of Linguistics, Yarinacocha, Pucallpa, Peru. Mr. Lauriault has lived with the Shipibo tribe for fifteen years. He is one of the few outsiders who speaks Shipibo fluently and is accepted by the Shipibo.

[4]Whenever possible, English and scientific names of plants and animals are given. When there are no corresponding English names, the Spanish or phonetic spelling of the Shipibo word is used.

Shipibo woman, showing use of ornaments made from silver or nickel coins, hanging from the nasal septum or from a hole punctured through the lower lip

Typical Shipibo house—mother and child in the hammock

squirrel, tapir, and various kinds of monkeys and birds. Meat is commonly eaten fresh, although these people know how to salt and smoke meat. Usually fresh game is shared with neighbors, either by inviting in friends or sending the meat to them raw or cooked.

Much time is spent in fishing (estimated at about seven-eighths compared with one-eighth in hunting). Harpoons, bows and arrows, spears, and lines are used, but no nets. Fish is sometimes preserved by salting or smoking.

Rock salt, refined sugar, polished rice, soft drinks, and alcoholic beverages are either bartered or purchased.

Income is obtained from selling salted fish, particularly paiche *(Arapaima gigas C)*, game and hides, pottery, and trinkets. They also sell unpolished rice, corn, and peanuts. Cash income is also occasionally obtained by working for a *patrón* in lumbering or agriculture.

Dietary Practices

Information about what the Shipibo people eat was obtained from many visits to the tribe by one author and from the other author who lived with the tribe for fifteen years. In studying the food habits, no weighed dietary surveys were attempted because of the irregular food supply from hunting and fishing. Without a prolonged survey, any observations would not have been truly representative of the tribal diet as consumed over a period of time.

The staple food of the Shipibo is the plantain (cooking banana). The next most frequently eaten foods are the sweet potato and yuca. Plantains are prepared in three ways according to the degree of ripeness. Green plantains are either roasted without the skin or grated raw and cooked with a broth of fish or meat. Semi-ripe plantains are sometimes cut lengthwise into strips and fried in fish oil, or roasted. Ripe plantains are either roasted in the skin, or made into a drink by boiling them whole and mashing with water. This liquid *(chapo)* is the principal beverage and is used throughout the day in place of water, which the Shipibo consider tasteless and will not drink. Plantain is eaten at every meal except under famine conditions.

Usually, either yuca or sweet potato is also eaten daily, though not at the same time. Yuca is roasted or boiled. Sweet potato is almost always boiled. The cooking fats used most often are fish oils and animal fats, principally monkey, but occasionally peccary and tapir. Sometimes palm oil is used. With a wide variety available, fish is eaten almost daily. It is either roasted or boiled with banana. Sometimes fish is steamed in wet plantain leaves. Beans are eaten infrequently and are not raised.

In a typical daily diet, breakfast consists of fish and roast plantain, and plantain drink *(chapo)*; and dinner, fish or meat gruel with green plantain, roast green plantain, yuca or sweet potato, and plantain drink. Fruits and plantain drink are taken freely throughout the day. Food is always heated before eating.

It is difficult to estimate the adequacy of the Shipibo diet, due to the lack of stability of food procurement. When fish and game are abundant, there are few dietary insufficiencies. Fish and game supply adequate amounts of protein, fat, iron, and thiamine. Since the bones of small fish are eaten, adequate calcium intake is possible. Although the banana and yuca are not usually considered sources of riboflavin, thiamine, and carotene, they are eaten in such quantities as to supply substantial amounts of these vitamins. The wide variety of between-meal

consumption of fruits insures adequate ascorbic acid intake.

When amounts of fish and game are limited, the diet becomes monotonous and heavily imbalanced toward carbohydrates. Protein becomes a dietary problem. The lack of vegetable proteins from beans and cereals magnifies this deficiency. Some oil is obtained from palm nuts when animal fats are not available. Under these conditions, calcium intake is very low. The content of thiamine, riboflavin, niacin, carotene, and ascorbic acid in the diet is probably satisfactory due to the heavy yuca and fruit consumption, particularly of banana.

Food Beliefs

The Shipibo eat because they are hungry. They see no positive relation between food and health. They do not eat capybara *(Hydrochoerus capybara)*, a spotted rodent, because they believe it may cause pinta, a skin condition. They do not eat jaguar *(Felis hernandesii)*, ocelot *(Felis pardalis)* or dogs (which they classify as cats), because they believe the meat will turn their hearts into a were-tiger. Neither are snakes, frogs, rats, grubs, alligator, or buzzard eaten. Papaya has low prestige value because it is considered a weed planted by the spirits that inhabit abandoned houses.

During pregnancy, meats having a large amount of blood are not eaten. Pregnant women also will not eat fruits from trees having thorns, believing that the thorns will hurt the child.

During sickness, salt, fat, and many sweet foods (fruits) are not fed because of a supposed high detrimental value. Sugar, however, is considered to have a low detrimental value. The most neutral food given during illness is green plantain. The only meat allowed is fowl. Fish and game have high detrimental values, the Shipibo believe, and are not eaten during serious illness.

There are few positive food beliefs.

Reference

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Adulterated Swiss Cheese Seized

Three lots of Swiss cheese totalling 2700 lb. have been seized and taken off the market by the Food and Drug Administration because of "artificial eyes.

According to the standard of identity established for Swiss cheese by the FDA in 1950, it must have large holes or "eyes" which are developed throughout the cheese curing. Swiss cheese with well developed shiny eyes, as compared with "blind Swiss" without naturally developed eyes, receives a higher grade under the grading system, is in greater demand by consumers, and commands a higher price.

A number of firms, according to the FDA, have been using Swiss cheese with little or no eye development in packages of sliced Swiss cheese. They have made artificial eyes with mechanical devices and further promoted the concealment of inferiority by rearranging slices in Cellophane-wrapped packages so that slices with well developed eyes are on the outside and slices with no or fewer holes are in the middle. Some firms have even labeled the article with artificial eyes as "natural." According to the FDA, the whole scheme of foisting off the inferior article is a deliberate plan calculated to give the perpetrator a few cents a pound more profit at the expense of the consumer.

The standard of identity reads: "At times, the so-called eyes do not form in Swiss cheese, and the resulting cheese is known as blind cheese. Such cheese, if cured for sixty days, will have the flavor of Swiss cheese, and it is suitable for manufacturing purposes but not for consumer consumption. The adoption of a definition and standard of identity of Swiss cheese for manufacturing which requires that such cheese conform to the definition and standard of identity for Swiss cheese, except that the eyes have not formed, will reasonably assure use of blind cheese for manufacturing purposes only. Since the lack of eyes will effectively distingush Swiss cheese, no special colored coating is necessary for Swiss cheese for manufacturing."

Blind cheese is used in cheese-containing products where Swiss cheese flavoring is desired.

Maternal and Infant Nutrition in Underdeveloped Countries[1]

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IN MOST UNDERDEVELOPED countries, the most striking feature with regard to the nutritional situation is that the average dietaries of expectant and nursing mothers are grossly inadequate. The full implications of this finding require careful investigation.

In a survey of over three hundred mothers belonging to the poor socio-economic group in South India, it was observed that the daily total caloric intake ranged between 1400 and 1800, with a mean protein intake of about 40 gm., the protein being mainly derived from vegetable sources. The mean calculated daily intakes for calcium, iron, and vitamin A were 350 mg., 18 mg., and 900 I.U., respectively. Thus, it is plain that the diets were inadequate in many respects.

In a great majority of these mothers, the diets during pregnancy were no different from those during non-pregnant periods. None of the mothers believed that pregnancy called for increased dietary intake. In fact, a number felt that dietary restriction might actually be beneficial for their pregnancy. The results of a study of the condition of these mothers during pregnancy and of their infants at birth will be briefly presented here.

The Condition of the Mother

CHANGES IN MATERNAL BODY WEIGHT DURING PREGNANCY

The average body weight of the women studied was about 42 kg. There was apparently no correlation between body weight and the age of the mother or the number of her pregnancies. This is contrary to findings in better fed mothers in whom significant increase in body weight with increase in age and number of pregnancies has been reported.

The mean increase in body weight between the twelfth and fortieth week of gestation in the mothers of this study was about 6 kg. Neither the age of the subject nor the body weight at the twelfth week of gestation appeared to influence the weight increase. The pattern of weight gain was the same in primigravidae and multigravidae, the maximum weight gain occurring between the twentieth and twenty-fourth week of pregnancy. A small number of women had no significant weight increase after the eighteenth week of gestation.

It will be noted that the weight gained by these mothers was considerably less than the values reported among well fed mothers in other parts of the world. What is the significance of this low gain in body weight? What is the effect of such low weight gain on the course of pregnancy and the condition of the infant at birth?

In pregnancy, there are obviously profound changes in body composition. To understand the real significance of changes in the body weight, one must know the underlying changes in body composition. In studying the body composition of eighteen of these women, it was observed that between the ninth and fourteenth week of gestation, the total body water was about 56 per cent of the body weight, a value which corresponds to that observed in the non-pregnant women of the same population. Between the twentieth and twenty-eighth week of gestation, total body water was about 66 per cent, and beyond the twenty-eighth week about 70 per cent. The interesting finding was that the increase in body weight which would have been expected from the absolute increment of total body weight was much greater than the actual increase in body weight. Since nitrogen balance studies indicated that these subjects were in positive balance on their usual protein intake, it can only be concluded that they were actually losing body fat during pregnancy. The lower weight gain of these under-

[1]Presented at the 43rd Annual Meeting of The American Dietetic Association in Cleveland, on October 20, 1960.

nourished mothers as compared with well fed pregnant women may reflect a greater loss of body fat rather than diminished increment of body protein and water. Similar studies of body composition of well fed mothers may serve to decide this question.

No correlation was found between the change in maternal body weights during pregnancy on the one hand and the birth weight of the infant or the course of pregnancy on the other.

HEMOGLOBIN, SERUM PROTEIN, AND SERUM VITAMIN A

In over three hundred pregnant women whose hemoglobin levels were studied, a progressive increase in the incidence of anemia occurred as pregnancy progressed. Two per cent of the subjects had hemoglobin levels of less than 10 gm. per 100 ml. in the first trimester, 16 per cent in the second trimester, and nearly 20 per cent in the third trimester.

Similarly, a progressive decline in serum albumin levels was noted with advancing pregnancy. The mean serum albumin level in the first trimester was 3.2 gm. per 100 ml., and in the last trimester, 2.4 gm. The mean serum albumin level in a group of non-pregnant women of the same community was 3.5 gm. per 100 ml.

Serum vitamin A levels also declined from 104 I.U. per 100 ml. in the first trimester to 88 I.U. in the second trimester and to 67 I.U. in the third trimester. There were, however, no significant changes in the serum carotene levels with advance in pregnancy.

Thus it is clear that the nutritional status of Indian women of the poor socio-economic group studied was far from satisfactory. Though the women did not exhibit gross clinical evidences of protein malnutrition, a large number showed manifestations of B-complex deficiency and anemia. A careful inquiry into the obstetrical history of the multigravidae in this series revealed that nearly a fifth of all pregnancies had terminated in abortions, premature deliveries, and still births. Though this enormous incidence of pregnancy wastage may not be entirely attributable to malnutrition, the predominant role of malnutrition in this end result may be legitimately inferred.

MATERNAL MALNUTRITION AND TOXEMIA

The incidence of the eclampsia in pregnancy among women of this poor socio-economic group in South India appears to be much higher than that among the well fed communities in Europe and North America. This has often raised the question of the role of malnutrition in toxemia of pregnancy.

A careful examination of the incidence of toxemias in pregnancy would, however, seem to indicate that when all types of toxemias, including pre-eclampsia, are considered, the difference between the observed incidence in Madras in South India and that reported in Europe and North America is not striking. This would indicate that a relatively greater proportion of toxemias are manifest as eclampsias among the women in Madras than among the other groups mentioned, while the total incidence of all types of toxemia is nearly the same. It might be unjustifiable to attribute this difference to malnutrition since other factors, such as difference in facilities for ante-natal care and treatment of early cases, may be largely concerned. The evidence for a specific role of malnutrition in toxemias of pregnancy is not convincing.

The Condition of the Infant at Birth

BIRTH WEIGHT

The birth weights of a large series of infants of Indian women belonging to the poor socio-economic group subsisting on diets similar to those described above were compared with those of Indian infants belonging to the better fed, high socio-economic group. All the babies in both groups were delivered in the hospitals and their birth weights were carefully recorded by trained hospital staff. Only weights of live infants born at full term were included.

The mean birth weight of infants of the low socio-economic group was about 2.8 kg., while that of infants of the high socio-economic group was about 3.1 kg. This difference was statistically significant. If all infants, including those who were not born at full term, had been included, the difference between the two groups would have been even wider.

Using a birth weight of 2.5 kg. as the criterion, the incidence of prematurity among the infants of the low socio-economic groups was nearly 30 per cent while the corresponding figure among the high socio-economic group was about 14 per cent. If a birth weight of 2.0 kg. was used as the criterion, the incidence of prematurity was less than 2 per cent among infants born to mothers in the high socio-economic group as compared with 10 per cent of the poor socio-economic group.

What is the significance of the relatively low birth weight of infants of undernourished mothers? It may be safely conceded that a birth weight of less than 2.5 kg. or even 2.0 kg. need not necessarily indicate prematurity or functional inadequacy. Indeed, most infants with such low birth weights were observed to thrive normally. It would appear, however, that while birth weight may not be a reliable clinical criterion in individual cases, it may be a useful yardstick when whole communities or population segments are considered.

An analysis of the infant mortality statistics in such underdeveloped regions would seem to bear

this out. For example, in Madras City in South India, the infant mortality rate was 136 per 1,000 live births in 1954. Nearly 25 per cent of these deaths occurred within seven days after birth and 40 per cent within the first month. Thus neonatal mortality contributed the bulk of infant mortality.

An analysis of the causes of neonatal deaths revealed that nearly 73 per cent of all these deaths occurred in infants with birth weights below 2.0 kg. It would thus appear that birth weight in a community is an index of neonatal viability and that maternal malnutrition which results in low birth weight also contributes to the high infant mortality.

THE BLOOD OF MOTHERS AND THEIR INFANTS

In an attempt to investigate the effect of maternal malnutrition on the condition of the infant, simultaneous determinations of some constituents in the blood of the mothers of the poor socio-economic group and of their infants were carried out. The values for infants were obtained from samples taken from either the sagittal sinus or from the umbilical cord. The mean hemoglobin content of venus blood of fifteen new born infants was 17.6 gm. per 100 ml., while that of their mothers was around 10.8 gm. per 100 ml. No statistical relationship could be observed between the maternal and infant hemoglobin levels. It is, however, obvious that the neonatal hemoglobin concentration cannot provide a reliable indication of the iron nutritional status of the infant.

The mean serum albumin levels in fifty mothers and their infants were 3.0 and 3.1 gm. per 100 ml., respectively. A significant correlation was found between the maternal and neonatal values, suggesting that maternal hypoalbuminemia was actually reflected in the new born. It would thus appear that infants in these poor communities start their lives with incipient malnutrition.

The serum vitamin A in the cord blood of nearly fifty new born infants was around 50 I.U. per 100 ml. as compared with 67 I.U. in the mothers. However, in a series of infants whose mothers were fed a daily oral supplement of nearly 40,000 I.U. vitamin A daily for some weeks before delivery, mean serum vitamin A levels were as high as 84 I.U. per 100 ml., indicating the effect of maternal status on the condition of the infant with regard to this nutrient. The problem of vitamin A deficiency in children in underdeveloped regions is one of the most urgent nutritional problems. It would seem that a rational approach to its solution might well consist in augmenting the hepatic vitamin A stores in the infant by insuring adequate vitamin A nutrition for the mother during her pregnancy.

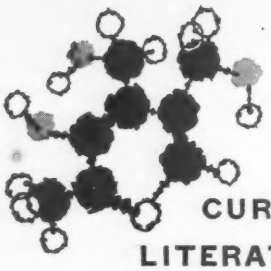
Conclusion

These observations indicate that the inadequate dietaries of pregnant women in some underdeveloped countries is reflected in the condition of both mother and infant. The mothers show less increase of body weight during pregnancy and a high incidence of anemia and signs of B-complex deficiency. They also have low serum albumin and vitamin A levels. Among women subsisting on inadequate dietaries, there is a high incidence of pregnancy wastage in the form of abortions and still births. The infants have relatively low birth weights and a high incidence of prematurity as judged by accepted criteria. Such low birth weights have been found to be associated with high neonatal mortality, contributing to the high infant mortality rates observed in underdeveloped regions. It would also appear that the poor nutritional status of the mothers with regard to protein and vitamin A is to some extent reflected in the infants, even at birth. The problems of protein malnutrition and vitamin A deficiencies which constitute the major nutritional hazards in infancy and childhood in these regions would thus to some extent appear to have their origin in maternal malnutrition.

While the malnutrition of the mothers subsisting on inadequate diets is understandable, what is intriguing is the fact that a large number of these mothers are able to go through pregnancy apparently normally and deliver normal infants of average birth weight. This raises some interesting and important questions connected with the adaptive mechanisms brought into play during pregnancy to meet the increased nutritional demands of the mother. Much more work is needed to understand these mechanisms. Unless this is done, a rational approach to the problem of maternal nutritional requirements during pregnancy will not be possible.

Low-Calorie Sour Cream

Sour cream has recently enjoyed great popularity as a base for "dips" and salad dressings and as a topping for baked potatoes. Such uses do present a "calorie problem," however. To nullify this disadvantage, T. J. Claydon of the Dairy Husbandry staff of Kansas State University has developed a method of making low-fat, cultured sour cream. To it, he adds small amounts of monoglyceride and gelatin, which act as stabilizing agents. Thus treated, the low-fat sour cream can be whipped and will maintain a good consistency. If made available commercially, it would be cheaper than high-fat sour cream, as well as lower in calories.



CURRENT LITERATURE

Contributed by Janette C. Carlsen, The Johns Hopkins Hospital, Baltimore; Clara Karl Frederick, Lombard, Illinois; Margene A. Wagstaff, Elmhurst, Illinois: the following dietetic interns of the VA Center, Los Angeles: Nancy L. Alcorn, Mary E. Flick, Carolyn Henricks, Kristin A. Holmberg, Karen Mund, Margaret M. Norton, and Mary Lee Verderaime; the dietetic interns, VA Hospital, Houston; and the JOURNAL *staff.*

THE AMERICAN JOURNAL OF CLINICAL NUTRITION

Vol. 9, May-June, 1961

*Serum magnesium and serum cholesterol changes in man. M. G. de Los Rios.—p. 315.

*Biological study of fifty-six-day protein-free diet in dogs. D. Dawson and J. G. Allen.—p. 320.

*Human availability studies of five vitamins in sustained release form. S. M. Greenberg, J. F. Herndon, D. R. MacDonnell, T. L. Flanagan, and A. Bondi.—p. 324.

*Renal clearance of calcium and phosphorus in experimental urolithiasis. I. R. Payne, E. L. Empey, and C. M. McCay.—p. 345.

*Follow-up study of serum cholesterol, diet and physical findings of Italian-American factory workers. M. B. McCann, M. F. Trulson, and F. J. Stare.—p. 351.

Serum Magnesium and Serum Cholesterol. The relationship of changes in serum magnesium concentration to changes in serum cholesterol concentration was studied. In one experiment in which there was a significant increase in serum cholesterol concentration, the mean serum magnesium level decreased slightly. In a second experiment, with even greater changes in serum cholesterol levels, no significant changes in serum magnesium levels were observed. It is concluded that in these experiments, no systematic relationship existed between changes in serum magnesium and serum cholesterol levels.

Biological Study of Protein-Free Diet. This study was designed to ascertain various physiologic and histopathologic changes in dogs maintained on a protein-free but calorically adequate diet. A number of behavioral, biochemical and anatomic changes were noted. Histologic findings revealed minimal or no fat in the tissues and organs, except for the adrenal gland. Fibroplasia plus fat and glycogen deposition were present in the adrenals, pointing to a hypoadrenal state with irreversible damage. The animals' ability to handle general stress conditions, such as disease or rapid environmental changes, would seem to be greatly impaired. An excessive glycogen deposition was seen in all of the specimens, especially in the liver.

Availability of Five Vitamins. The availability and pattern of absorption of five vitamins (thiamine, riboflavin, ascorbic acid, niacin, and pyridoxine), as measured by urinary excretion, from immediate and sustained release forms, were studied in human subjects. Based on a 24-hr. urine collection, the availabilities of sustained release vitamins were calculated as the following percentages of those from the immediate release formulation: riboflavin, 85.2; pyridoxine, 168.6; thiamine, 155.8; niacin, 90.4; and ascorbic acid, 92.7. All vitamins except ascorbic acid showed significant sustained release effects when administered in a sustained release formulation and compared with equal amounts of vitamins administered in an immediate release form. Ascorbic acid studies suffered from a lack of adequate saturation of the test subjects with the basal diet used.

Renal Clearance in Urolithiasis. Urolithiasis (calcification in kidneys) is a formidable problem, especially with ulcer patients. Renal functions were studied in rats with urolithiasis and in healthy ones by measuring the filtration and reabsorption of calcium and phosphorus in the two groups of animals. It was found that with calculus-producing diets, calcium reabsorption was inhibited, while phosphorus reabsorption was not. Hyperphosphatemia was found in rats receiving a milk-alkali diet and in rats receiving the same milk-alkali diet with 10 mg. per cent magnesium added. No indication of reversal of calcification was found in animals when given laboratory chow plus 1 per cent ammonium chloride. Whether calcification is the cause or the effect of changes in renal function remains to be answered.

Cholesterol, Diet, and Physical Findings. A repeat study of serum cholesterol, diet, and physical findings of Italian-American factory workers was carried out after a two year interval. For the group, there were no significant changes in serum cholesterol levels or relative weight, although some persons showed considerable change. The mean serum cholesterol level of smokers of one or more packages of cigarettes a day was significantly higher and their relative weight was significantly lower than that of non-smokers. The repeat dietary histories showed no significant mean differences in calories or grams of fat and protein for the group, but individual variations were found. The considerable variation in individual data for the two years may be partly due to the interview method. Although the dietary interview has shortcomings, it was the most practical method for this study.

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Vol. 6, n.s., April 1961

*Nutritional aspects of gastrointestinal disease. S. Zubirán.—p. 336.

Nutritional Aspects of Gastrointestinal Disease. The nutritional factor in gastrointestinal disease has two possible pathogenetic aspects: (a) malnutrition secondary to gastrointestinal disease and (b) gastrointestinal disturbances resulting from primary malnutrition. The majority of the Mexican population have a deficient diet as compared with that recommended for normal individuals. Nutritional surveys — including dietary, clinical, laboratory, anthropologic, and economic aspects—have been carried out by the Instituto Nacional de la Nutrition in sixteen representative zones in Mexico. According to these surveys, the rural population, which represents about 65 per cent of the total, exhibits endemic malnutrition. The diet of this population segment, made up mainly of corn and very limited quantities of other foods, is deficient in almost every element, particularly in animal protein. The mean daily caloric intake is 2000; protein intake is 50 gm., and animal protein 12 gm. daily. The foods are not only deficient in proteins, but also have a low biologic value because of the low content and poor balance of the more important amino acids. An excess of leucine and marked deficiencies of methionine and tryptophan are particularly noteworthy. In spite of the obviously deficient diet, the adult population as a rule appears in good health with practically no evidence of malnutrition. It is believed that this adaptation is the result of centuries of such a diet.

THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES

Vol. 241, May, 1961

*Lipemia clearing effect of buccally administered heparin potassium (Clarin). I. Hirshleifer and R. Nayak.—p. 645.

Lipemia-Clearing Effect. Heparin potassium has been confirmed in this experiment to be a lipemia-clearing agent. The use of this lipoprotein lipase activator is a factor in the interruption of atherogenesis, that is, in coronary artery disease and myocardial infarction. In the experiment, a high-fat meal was given to test the tolerance of blood lipid values. Some patients were responsive to the fat meal challenge in that the total lipid levels rose and remained elevated. These patients were found to respond to the inhibiting action on the elevation of serum total lipids by administration of heparin potassium.

AMERICAN JOURNAL OF PUBLIC HEALTH

Vol. 51, May, 1961

*Suggestions for dealing effectively with poultry hygiene problems. J. W. Atkinson.—p. 723.

Poultry Hygiene Problems. A federal poultry inspection law was enacted by Congress in 1957. This federal service is now being supplemented by an increasing number of state and local programs. Official poultry hygiene programs will be most effective when they are coordinated into a uniform, comprehensive approach to the health and consumer problems associated with the broad scope of poultry production, processing, storage, transport, sale, and service. Superficial appearances can be deceiving. Careful attention to detail by persons well trained and experienced in food sanitation principles will be required to prevent those conditions and practices which result in routine mass contamination of a product. Health agencies should exert leadership to assure that health and consumer interests receive paramount consideration in processing poultry.

THE AMERICAN JOURNAL OF SURGERY

Vol. 101, May, 1961

*Practical aspects of the management of severely burned children. E. T. Boles, and J. L. Terry.—p. 668.

Management of the Severly Burned Child. From the end of the shock phase until healing is complete, infection, nutrition, and anemia form a triad of problems which must be adequately handled if the severely burned child is to recover. On admission, the child is placed in the surgical room where he is evaluated and carefully treated. In preventing infection, aseptic techniques, careful isolation of the patient, and prophylactic antibiotic therapy are enforced. Nasogastric tube feedings are relied on as the principle route of nutrition. The "burn formula" containing 70 gm. protein and 1000 calories per liter is begun. Vitamins are added to the nutritional program, giving a minimum of 500 mg. ascorbic acid daily and a standard B-complex supplement. Anemia and blood volume deficits are forestalled by repeated blood transfusions.

ANNALS OF BIOCHEMISTRY AND EXPERIMENTAL MEDICINE

Vol. 10, November, 1960

*Studies in experimental hypercholesterolemia in rats. I. Effect of feeding hydrogenated groundnut oil, groundnut oil and ghee (butter fat) with cholesterol on lipid partition in plasma and liver. H. R. Cama, B. R. Das, and S. Tawde.—p. 281.

*Studies in experimental hypercholesterolemia in rats. II. Effect of feeding sesame and coconut oils with cholesterol on lipid partition in plasma and liver. H. R. Cama, B. R. Das, and S. Tawde.—p. 287.

*The effect of partial or complete replacement of rice in poor vegetarian diet by jowar *(Sorghum vulgare)* on the growth and composition of blood and liver of albino rats. P. P. Kurien, M. Narayana Rao, M. Swaminathan, A. N. Sankaran, and V. Subrahmanyan.—p. 293.

*Studies on the availability of iron in concentrate of rice polishings. C. H. Chakrabarti, K. I. Saxena, and M. C. Nath.—p. 299.

Vol. 10, December, 1960

*Supplementary value of strained foods based on mango pulp to milk-cereal diet. S. Korula, K. Joseph, M. Narayana Rao, K. Indiramma, and G. S. Siddappa.—p. 327.

*Effect of varying levels of protein and calcium in the diet on the structure and composition of liver of rats. I. The effect of supplementation of diets based on rice and rice-tapioca with calcium on the growth and structure and composition of liver of albino rats. A. P. Jayaraj, K. Joseph, M. Narayana Rao, R. K. Bhagavan, M. Swaminathan, and V. Subrahmanyan.—p. 341.

Feeding Peanut Oil and Ghee with Cholesterol. The effect of feeding hydrogenated groundnut (peanut) oil, groundnut oil and ghee (butter fat), together with extraneous cholesterol, for twelve weeks on the plasma and hepatic lipid distribution of rats was studied. Feeding of cholesterol with these fats caused an increase in plasma and hepatic cholesterol levels, in total lipid phosphorus and total cholesterol:total lipid phosphorus ratio, and a decrease in free cholesterol:total cholesterol ratio. Among the fats tested, groundnut oil with cholesterol produced the highest degree of plasma and liver cholesterol accumulation, hydrogenated groundnut oil and ghee coming next. It appears from these studies that oleic acid level of the fat may be critical in causing tissue cholesterol accumulation.

Feeding Sesame and Coconut Oils with Cholesterol. The effect of feeding sesame oil, groundnut oil, and coconut oil at 25 per cent level with 1 per cent added cholesterol for eighteen weeks on the plasma and hepatic lipid distribution of rats was studied. There was maximum plasma and hepatic cholesterol accumulation in the rats on groundnut oil, followed by those on sesame and coconut oils. Accumulation of tissue cholesterol can be explained on the basis of the relative fatty acid composition of the dietary fats, confirming a previous observation on the critical role of the oleic acid content of the dietary fat.

Replacement of Rice by Jowar. Replacement of rice in a poor vegetarian diet either partially (25 or 50 per cent) or completely by jowar did not affect to any significant extent the over-all nutritive value of the diet as judged by the growth of rats. There was no significant difference in the hemoglobin and red blood cell count. The average fat contents of the liver were within the normal range. The average protein content of the livers of animals fed on jowar diet was, however, significantly less than that of animals fed on rice or rice-jowar diets.

Availability of Iron of Rice Polishings. Rice polishings concentrate was shown to promote regeneration of blood hemoglobin in albino rats made anemic by intraperitoneal injection of phenylhydrazine hydrochloride. It is more effective in this respect than ferric ammonium citrate.

Supplementary Values of Strained Foods. Growth experiments were carried out to evaluate the supplementary value of strained mango pulp to rice-milk diet. No significant difference was observed in the average weekly increase in weight of rats fed either on rice-milk or the same supplemented with mango custard. The red blood cell counts of rats receiving mango custard were significantly higher, but there was no significant difference in the hemoglobin content. The fat content of liver of animals supplemented with mango was significantly lower than on the control rice-milk diet. No significant difference was observed either in the moisture, fat, protein, or ash content of the animal body. The rats receiving supplements of mango custard or mango custard powder retained significantly larger amounts of nitrogen, calcium, and phosphorus than those on the control rice-milk diet.

Calcium Supplementation and the Liver. Replacement of 25 per cent of rice in poor vegetarian rice diet by tapioca flour enhanced the growth of rats. Supplementation of the rice diet with the same amount of calcium (10 mg. per 100 gm.) as that supplied by tapioca in the rice-tapioca diet also enhanced the growth of rats to a significant extent, while supplementation of both rice and rice-tapioca diet with higher amounts of calcium (200 mg. per 100 gm. diet) caused a marked improvement in the growth of rats. Examination of the livers of animals fed on rice, rice-tapioca, and rice-calcium (10 mg. per 100 gm. diet) showed mild to moderate parenchymal damage to the protein deficiency type, while the livers of rats fed on rice or rice-tapioca diets fortified with 200 mg. calcium per 100 gm. diet showed progressive improvement and were almost normal at the end of six months.

BRITISH MEDICAL JOURNAL

No. 5232, April 15, 1961

*Experimental and clinical observations on poldine in treatment of duodenal ulcer. J. E. Lennard-Jones.—p. 1071.

No. 5233, April 22, 1961

*Relation between diuretic agents and aldosterone in cardiac and cirrhotic patients with sodium retention. J. P. Thomas and F. C. Bartter.—p. 1134.

Poldine in Treating Duodenal Ulcer. Poldine methosulphate, even in doses large enough to produce severe side-effects, did not reduce the acidity of the gastric contents of patients with duodenal ulcer eating a bland diet. Gastric acidity was reduced by poldine under special conditions when patients took hourly drinks of milk-cream without other food. Poldine apparently augmented the effect of a regimen of regular antacid by day but did not prolong the effect of a dose of alkali at bedtime. No therapeutic benefit from poldine in duodenal ulcer was demonstrated.

Diuretic Agents in Sodium Retention. Within an air-conditioned metabolic unit, sedentary activity was permitted the seven cardiac or cirrhotic

patients under study. Each patient was given a constant diet containing 9 mEq sodium a day and a constant volume of distilled water. Two of the seven patients were unable to tolerate addition of sodium to their diets, but the remainder received an extra 41 mEq sodium, as sodium chloride, to make a daily total of 5 mEq. Hydrochlorothiazide produced a marked loss of potassium in edematous patients, particularly during the first two days of therapy. Despite the decrease of aldosterone secretion, sodium excretion was limited, presumably as a result of potassium depletion. The addition of small doses of spironolactone permitted sodium diuresis with limited potassium loss, presumably by blocking electrolyte exchange in the distal tubules. Corresponding doses of spironolactone, given alone, produced minimal sodium loss. In most patients with congestive failure, changes of renal hemodynamics may be responsible for sodium retention.

THE CANADIAN MEDICAL ASSOCIATION JOURNAL

Vol. 84, May 6, 1961

*Observations on phenylketonuria in Ontario. M. W. Partington.—p. 985.

Phenylketonuria in Ontario. Details are given of the age, sex, and racial distribution, geographic location, and mortality of ninety-eight patients with phenylketonuria from Ontario. By current estimates of the incidence of the disease, the eighty-three living patients in this series represent about one-third of the province's phenylketonuric population. The age distribution suggests that untreated phenylketonuria has an increased mortality rate but that this is no higher than that associated with mental defect in general. There is some evidence that a history of infantile eczema worsens the prognosis. Phenylketonuria is reported in an apparently pure blood Ojibwa Indian. The corrected ratio of patients affected with phenylketonuria to their unaffected sibs agreed closely with the ratio of one to three expected in a recessively inherited disorder.

DIABETES

Vol. 10, May-June, 1961

*Survival of diabetics with proteinuria. F. I. Caird.—p. 178.

*Evaluation of sorbitol in the diet of diabetic children at camp. J. Steinke, F. C. Wood, Jr., L. Domenge, A. Marble, and A. E. Renold.—p. 218.

Diabetic Patients with Proteinuria. One hundred and thirty-four diabetic patients were followed for up to ten years from the onset of proteinuria. Their survival was compared with estimates of that expected of the general population and of all diabetic persons. Sixty-five per cent survived five years and 28 per cent, ten years. This represents 77 per cent of the natural expected rate for five years, and 44 per cent for ten years, and 89 per cent and 59 per cent respectively of the diabetic expected rate. It is concluded that the prognosis for life of diabetic persons with proteinuria is better than believed previously.

Sorbitol in Diet of Diabetic Children. The metabolism of fructose and sorbitol is reviewed in this paper and an attempt is made to evaluate the possible usefulness of sorbitol as an adjunct to the therapy of diabetes in children and young adults. The rationale for this therapy is based on the possible metabolic benefit to be derived from (a) the availability to hepatic metabolism of a hexose (fructose) of which the initial phosphorylation is not insulin dependent, and (b) the availability to all tissues of metabolites of this hexose, such as lactate and pyruvate. Sorbitol may be preferable to fructose because of the apparent lack of sorbitol metabolism during intestinal absorption. While the slow rate of intestinal absorption of sorbitol accounts for its laxative effect at dose levels in excess of 50 gm. per day, it also may be of special usefulness in continuously providing small amounts of carbohydrate to hepatic metabolism throughout a large portion of the 24-hr. period. Sorbitol was added to the diet of boys at a summer camp for periods varying from eight to forty-eight days. Up to 40 gm. sorbitol daily, given in three daily doses during meals, was tolerated without gastrointestinal side effects and without evidence of increasing insulin requirement.

FOOD TECHNOLOGY

Vol. 15, May, 1961

*Food uses and properties of soybean protein. I. Food uses. A. K. Smith and W. J. Wolf.—p. 4.

*Stabilized raisins for dry cereal products. G. G. Watters and J. E. Brekke.—p. 236.

*Radiation preservation of milk and milk products. XII. Radiation sterilization of milk in a rotary-disc apparatus. G. D. Saravacos, J. E. Hoff, S. A. Goldblith, and E. L. Wick.—p. 239.

*Effect of added sugar on consumer acceptance of canned peas. K. G. Weckel, W. D. Mathias, G. F. Garnatz, and M. Lyle.—p. 241.

*Salad dressings stable to frozen storage. H. L. Hanson and L. R. Fletcher.—p. 256.

Food Uses of Soybean Protein. Whole soybean may be baked, boiled, used for making sprouts, fresh and dried tofu, vegetable milk, yuba, and many fermented products. In the U. S., the trend has been to use a special grade of defatted soybean meal and of protein concentrates derived from the meal. These fractions include the acid precipitated protein, soluble soybean proteinate, protein concentrate 70, aerating agents, soy flour, and alcohol-washed or Gelsoy-type products. These products are used not alone but combined in standard-type food products for their functional effect or for improvement of protein nutrition. Food use of U. S. soybeans is expanding more rapidly in foreign countries than domestically.

Stabilized Raisins for Dry Cereals. Materials for stabilizing raisins against loss of moisture were studied. Beeswax was the best moisture barrier of the edible coatings tested. Diluting beeswax with cottonseed oil or other vegetable oils increased its permeability to water vapor. A method for the application of a moisture barrier to raisins was devised. The raisins are dusted with starch and then coated with beeswax or a mixture of beeswax and vegetable oil. Untreated raisins stored with bran flakes became hard and inedible in about one-fourth of the time required for wax-coated raisins. Texture measurements with a shear press indicate increasing toughness as raisins are dried out.

Radiation Preservation of Milk. An apparatus was constructed that allows the production of sterile concentrated (3:1) milk that is essentially free of off-flavor. Polyphosphate-treated milk processed in this manner may be stored at 30°C. in sterile form without gelation for at least six months. It is possible that this apparatus may find practical use in the electron irradiation of other liquids of suitable viscosity.

Added Sugar to Canned Peas. Added sugar, within the range 3.1 to 8.7 per cent, in the brine of canned peas was evaluated by consumers. The highest level was preferred significantly, and the next highest (7.35 per cent) was preferred. Both these levels are higher than generally used commercially. Added sugar increased total solids and alcohol-insoluble solids very slightly, gave a technically significant increase in drained weight, and appeared to cause a reduction in color values.

Salad Dressings Stable to Frozen Storage. Factors influencing oil and water separation from salad dressings composed of emulsions and starch paste conforming to the oil and egg-yolk specifications of the standards of identity were evaluated at temperatures ranging from +20° to −50°F. Oil separation is minimized when the oil used does not crystallize, crystallizes to a limited extent, or crystallizes slowly. Waxy rice flour is superior to other thickening agents because of its slower rate of retrogradation. Increasing the egg-yolk level increases stability. The emulsifying function of egg yolk decreases as the storage temperature of frozen salted yolk is lowered. Increasing the salt level from 0.5 to 1.7 per cent increases stability. An increase in the emulsion percentage increases the tendency to oil separation; an increase in paste increases the tendency to water separation.

FOOD AND NUTRITION NOTES AND REVIEWS (Australia)

Vol. 18, January-February, 1961

*The effects of heat on cooking fats. N. E. Kirk.—p. 3.

Effects of Heat on Cooking Fats. The important non-caloric property of fat is its content of the polyunsatu-

rated "essential" fatty acids, and any change in nutritive value is due to destruction of these essential fatty acids. There is a suggested relationship between the unsaturated fatty acid content of a fat and its susceptibility to heat damage. In laboratory tests with frying oils, the formation of non-absorbable or even toxic oxidative products and polymers has been observed. However, the conditions used were not those that would be encountered in normal frying operations where temperatures seldom rise above 400° F. and are generally too mild to cause heat damage to the oil. The results of the few studies that have been conducted on oils used in commercial frying operations indicate that there is little change in the degree of saturation of the oil and no difference in nutritive value.

GASTROENTEROLOGY

Vol. 40, May, 1961

*Effect of a sulfated polysaccharide on peptic digestion. D. W. Piper and B. Fenton.—p. 638.

Peptic Digestion. A study was done at the University of Sidney, in Australia, on a sulfated polysaccharide, carrageenin (Ebimar), derived from seaweed. Carrageenin inhibited peptic digestion. Results of the study show that it appears to act predominantly on the substrate in digestion. Pepsin concentration does not affect its action, but high substrate levels decrease its activity. It alters the electrophoretic mobility of albumin at *p*H 2 and 4, but shows little effect on pepsin at these levels.

GERIATRICS

Vol. 16, May, 1961

*Oral hypoglycemic therapy: long-term results in older diabetic patients. T. A. Skillman, G. J. Hamwi, H. Driskill, and M. H. Penrose.—p. 209.

*Meals on Wheels: 1960. M. D. Keller and C. E. Smith.—p. 237.

Oral Hypoglycemic Therapy. When eighty patients (average age 67.8 years) were treated with 1 to 2 gm. tolbutamide daily, 62.5 per cent responded optimally within thirty days. However, over a twenty-four-month period, approximately 2.5 per cent of these responsive patients failed during each month of continued treatment. When seventy patients were treated with chlorpropamide in daily doses of 0.1 to 0.5 gm., 57 per cent responded optimally within thirty days, and the rate of secondary failure was approximately 1 per cent monthly. One third of the patients who were primary or secondary failures with tolbutamide responded when treated with chlorpropamide. The probability of primary or secondary response or failure could not be predicted. Treatment with the oral agents did not appear to influence body weight, and no evidence of severe toxicity was noted.

Meals-on-Wheels. Meals-on-wheels programs are among the newest services available for the homebound. Of the fourteen programs known to the authors, all but one were started since 1957. The impetus for the development has come from a variety of voluntary organizations and citizens' groups, rather than the official governmental agencies. Each program has developed according to local resources. The object of the programs is to increase the independence of the recipients. Eligibility is generally based on age, economic needs, and inability to prepare adequate meals. This paper describes briefly the nature of existing programs in this country and in England.

JOURNAL OF THE AMERICAN GERIATRICS SOCIETY

Vol. 9, May, 1961

*Cholesteremia of rabbits fed carbohydrate diets. O. J. Pollak.—p. 349.

*Nutritional supplementation for elderly patients in a state mental hospital: effect on appetite and weight gain. O. L. Gericke, L. G. Lobb, and D. E. Allinger.—p. 381.

Cholesteremia and Carbohydrate Diets. Blood cholesterol level is influenced not only by dietary lipids but also by dietary proteins and carbohydrates. In this study, the effect of feeding seven different carbohydrate diets, including dextrose, fructose, maltose, sucrose, rice, corn starch, and potato starch, was observed in rabbits. These carbohydrates had no effect on the concentration of blood cholesterol in normocholesteremic rabbits. In hypercholesteremic rabbits there was a fairly uniform delay in the rate at which the blood cholesterol level returned to pre-experimental values. Combined cholesterol-carbohydrate feeding had varied effects. Potato starch, and particularly corn starch, enhanced the degree of hypercholesteremia. A cholesterol-rice diet or a cholesterol-dextrose diet had an effect comparable to that of cholesterol administration. In rabbits fed cholesterol and maltose, the blood cholesterol level rose less than in the controls. A combined cholesterol-sucrose diet resulted in only a moderate elevation of the blood cholesterol level. The reasons for these varied effects of carbohydrate diets on the concentration of blood cholesterol in rabbits are discussed.

Nutritional Supplementation in the Aged. In this study, a nutritional supplement composed of Meritene (protein, carbohydrate, fat, vitamins, and minerals) plus nonfat dry milk and water produced a substantial weight gain over an eight-week period in a group of twenty-three elderly psychotic women. The percentage weight gain was almost three times that of the controls. In addition, measurements of plate wastage revealed that the nutritional additive did supplement and did not decrease the ordinary food intake at mealtime. Emphasis on food intake and concern for the patient's eating habits are also important factors in the maintenance of nutrition in an institutional setting.

JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

Vol. 176, May 6, 1961

*Formula diets and weight control. Council on Foods and Nutrition.—p. 439.

*Formula diets and weight control. Editorials.—p. 442.

*Misused vitamin therapy. Foreign Mail-France.—p. 464.

*Biblical reason for forbidding use of milk and meat. Letters to the Journal.—p. 467.

*Dumping syndrome. Questions and Answers.—p. 478.

Vol. 176, May 13, 1961

*Bioflavonoids. Questions and Answers.—p. 563.

Vol. 176, May 20, 1961

*Electrolyte excretion and hypotensive response. N. Fallis and R. V. Ford.—p. 581.

*Serum beta-lipoproteins in the pre- and postmenopausal female. C. L. Heiskell, A. Yachi, H. J. Aldrich, and C. M. Carpenter.—p. 585.

*Nutrition of school children. Foreign Mail-India.—p. 632.

*Malnutrition in children. Foreign Mail-India.—p. 633.

*Serum protein levels. Foreign Mail-India.—p. 633.

*Inspection for trichinae. Letter to the Journal.—p. 635.

*Peptic ulcer. Questions and Answers.—p. 642.

*Olive oil. Questions and Answers.—p. 642.

*Sodium in drinking water. Questions and Answers.—p. 644.

Vol. 176, June 3, 1961

*Highlights on the cholesterol-fats, diets and atherosclerosis problem. G. A. Goldsmith.—p. 783.

Diet and stress in vascular disease. Editorials.—p. 806.

*Saturated fats. Questions and Answers—p. 833.

Formula Diets and Weight Control. This paper constitutes the statement of the Council on Foods and Nutrition, A.M.A., on formula diets and weight control. According to the Council, complete dependence on formulas does not constitute a rational approach to weight reduction and weight control over the long term. In addition to weight adjustment, the patient's psychologic management and education toward correct dietary habits are the most important goals in any long-term program. A therapeutic formula diet in no way resembles the obese individual's ordinary diet. The Council questions whether it is sound to recommend the same caloric intake for all patients seeking weight control. It is the opinion of the Council that excessive rates of weight loss or large fluctuations in weight in obese individuals who restrict their caloric intake excessively or spasmodically may be undesirable. Extensive weight reduction should be carried out only with a physician's guidance, and with diets calculated to the individual patient's needs. Education of the individual to the faults of his past dietary practice is important. The Council states that only the dietary program which results in permanent weight loss and lifetime control of weight will be a satisfactory one.

Formula Diets. In this editorial, Philip White comments on formula

diets and weight control. At last count there were sixty to eighty types of 850-, 900-, and 1100-calorie "complete" formula diets on the market. In turn, these are marketed by hundreds of dairy, food, and pharmaceutical manufacturers. It is clear that the public is frantically looking for an easy cure for obesity, and commerce knows a good thing when it sees it. He points out that without knowledge of maintenance caloric requirement, and the desirable caloric decrement, it is impossible to tailor the diet to the patient. Yet, this is done for the patient by the manufacturers in the advertising and on the labels. The level of 900 calories was probably chosen so that even the smallest person would lose weight. Even though most advertisements suggest the formula user consult his physician, they often also suggest weight loss possibilities of up to 5 lb. a week. It does not seem reasonable that lay promotion should promise definite weight losses while at the same time suggesting a physican's guidance. All too often the "consult your physician" rubric is just a disclaimer for responsibility. Although formula diets under supervision may have some adjunctive value in a weight-control program, they should not be recommended as a total regimen or used solely under the patient's control. Dr. White concludes that the dietary program which results in lifetime maintenance of a desirable weight will be the only one of benefit to the obese patient.

Misused Vitamin Therapy. This investigator objects to the notion that water-soluble vitamins are non-toxic. He believes that, except in cases of deficiency, the administration of large doses of vitamins, especially of ascorbic acid, is dangerous. Guinea pigs were more sensitive to a scurvigenic diet, after treatment with large doses of ascorbic acid. In the blockade of Leningrad, the incidence of scurvy was 81 per cent among those who had previously received large doses of this vitamin, in contrast to 67 per cent among those who had not received the vitamin. A similar danger may exist during pregnancy and lactation, periods of training in sports, or in the course of infectious diseases. The systemic need for ascorbic acid is increased in all of these instances, but the system itself, being used to receiving large doses of it, is incapable of reacting against a comparative deficiency.

Biblical Reason for Dietary Laws. Forbidding the use of milk and meat because they are infected with *Brucella* is erroneous, according to the physician writing this letter. He states that in reality, there is no biblical prohibition of milk and meat. What is forbidden, is the cooking together of milk and meat: "Thou shalt not cook the kid in the milk of its mother." This has been extended in Talmudic times to the prohibition of eating milk and meat together. The meaning has, like all Jewish biblical dietetic laws, nothing to do with hygiene. The prohibition of eating pork was a part of the fight of the patriarchal monotheistic tradition against the cult of the mother goddess. The cooking of the kid in the milk of its mother, as well as the eating of the totem animal, represented by the boar, were rites of the mother-son cult in the surrounding cultures.

Dumping Syndrome. The medical management of the dumping syndrome includes a diet relatively high in protein, taken as frequent small dry feedings, and eaten preferably in the recumbent or semirecumbent position. Fluids should not be consumed with the meals, but are best taken between meals. Frequently, simple dietary modifications to eliminate obvious gastrointestinal irritants will relieve much of the distress. Sedatives, tranquilizers, and anticholinergic drugs have been helpful. The psychosomatic orientation of the patient is often an important factor in patients with prolonged distress, and efforts should be made to ascertain and eliminate as much emotional stress and tension as possible. Occasionally, if all medical measures fail to relieve a true dumping syndrome, re-operation to reduce the size of the gastrojejunostomy stoma or conversion to an anastomosis seems desirable. In some patients with dumping syndrome who have been observed for periods of up to ten years, the symptoms gradually diminish and often can be controlled by avoiding known inciting causes.

Bioflavonoids. Although favorable results have been reported in using bioflavonoids, alone or combined with ascorbic acid, for the treatment and prevention of the common cold, the Council on Drugs and the Council on Foods and Nutrition, A.M.A., report that flavonoids have no significant effect, palliative or otherwise on the course of the common cold.

Electrolyte Excretion and Hypotensive Response. In this study, the proper relationship of dietary sodium and potassium to the amount of hydrochlorothiazide necessary to produce a clinically satisfactory hypotensive response without producing serious electrolyte imbalance was investigated. In five hypertensive patients, when sodium intake was moderately restricted (50 mEq per day—about 3 gm. sodium chloride) and dietary potassium was near average (50 mEq per day), 50 mg. hydrochlorothiazide daily produced a satisfactory decline in blood pressure without causing problems of electrolyte imbalance. When dietary sodium was increased to 100 mEq per day, it was necessary to increase hydrochlorothiazide to 100 mg. daily to maintain a comparable satisfactory antihypertensive response, but this dosage produced a deficiency of potassium. The desirable treatment for uncomplicated hypertension appears to be low doses of hydrochlorothiazide, moderate salt restriction, and a potassium-enriched diet.

Serum Beta-Lipoproteins in Women. The serum beta-lipoproteins in 124 premenopausal and 248 postmenopausal women were measured. The mean premenopausal and postmenopausal levels were 1.9 ± 0.6 and 2.5 ± 1.0 immunocrit units, respectively. There was significant correlation of serum beta-lipoprotein levels with age for the group as a whole, but this appeared to have been the result of a relatively sharp rise in the mean level at the time of menopause. Postmenopausal patients may benefit from estrogen-replacement therapy, not only for the relief of vasomotor symptoms but also because of the possible prophylactic effects with respect to eventual development of atherosclerotic disease.

Nutrition of School Children. About 48 per cent of all deaths in 1955 in Madras State, India, occurred in children under fifteen years of age; about 7 per cent occurred in the group, ages five to fifteen years. A study was made of children between six and twelve years of age from poor and lower-middle class families. Their diet consisted mainly of cooked millet and boiled rice; animal foods including milk were rarely added. The commonest deficiency observed was that of vitamin A, manifested as xerosis. A few showed signs of riboflavin or niacin deficiency. A significant amount of latent or unsuspected disease was encountered; 92.7 per cent of the children had some disorder, such as diminished visual acuity, scabies, enlarged tonsils, dental caries, or hepatomegaly. Low levels of serum albumin, iron, and vitamin A were shown, and none had normal erythrocytes. Education in schools, in village health centers, and by the visiting public health workers in proper nutrition was suggested as an important step in correcting this situation.

Malnutrition in Children. Investigators studied a series of sixty Indian children who failed to put on weight, but showed no evidence of metabolic or endocrine disorder or chronic infection. Reserpine was given to overcome the irritability and improper eating habits of most of these patients; thiamine, to improve the appetite; and vitamin B_{12} to promote growth. This combination had a growth-promoting effect, especially in irritable children with poor appetite. The height of these children was not affected appreciably, but thirty-five of the children treated showed a significant gain in weight.

Serum Protein Levels. The average levels and range of variation of serum protein fractions in fifty normal Indians was determined by paper electrophoresis. The total serum protein value ranged between 6.0 and 7.9 gm. per 100 ml. (average 7.1). The albumin-globulin ratio varied from 3.5 to 0.9 (average 1.5). Of the various fractions of globulin, gamma globulin showed the highest levels. Age and sex had no significant influence on the levels of total serum proteins or the

various fractions. The levels for gamma globulin were higher than those reported in the West.

Inspection for Trichinae. It is true that in the U.S. hog carcasses are not inspected for trichinae under federal meat inspection. However, under present federal inspection requirements, ready-to-eat products including frankfurters, summer sausage, cooked hams, and others, are treated in federally inspected meat packing establishments to destroy all viable trichinae. Controlled heating, special refrigeration, or other processing, including salting, drying, and smoking, are applied to these products under continuous scrutiny of federal inspectors. These pork products are not released until all requirements for destruction of live trichinae have been fully carried out.

Peptic Ulcer. Healing of peptic ulcer is most effectively promoted by minimizing the corrosive action of acid-pepsin. Until we develop drugs which will prevent the secretion of acid, chemical neutralization remains the keystone of ulcer therapy. The availability of excellent antacid preparations, and the possibility that excess consumption of milk products is detrimental to the coronary arteries, have rendered the milk diet obsolete. A patient with uncomplicated peptic ulcer will almost invariably respond rapidly and completely to a regimen consisting essentially of an ounce of one of the aluminum hydroxide-magnesium trisilicate preparations every waking hour and a diet individualized to his own tolerance. Eating after the evening meal should be discouraged because it promotes night secretion.

Olive Oil. Olive oil is composed of triglycerides that contain 7.1 per cent linoleic acid, a polyunsaturated fatty acid; 78.5 per cent oleic acid, a monounsaturated fatty acid; and 14.2 per cent saturated fatty acids. From a chemical standpoint, one would conclude that olive oil is principally an unsaturated fat. But, as related to the observed reduction of serum cholesterol levels when polyunsaturated fats are fed, it has been shown that oleic acid and olive oil have essentially no effect, and are considered neutral.

Sodium in Drinking Water. Household water softeners exchanging calcium and magnesium ions for sodium and "regenerated" by brine will add sodium to water. The amount exchanged will depend on the hardness of the water and the efficiency of the softener. The amount of sodium naturally in the water varies with the locale and must also be considered. Municipal water-treatment plants sometimes soften hard water with zeolite or soda lime which can add a large amount of sodium. Values for sodium in municipal water can be obtained from treatment plants. For practical purposes, however, the chlorothiazide group of diuretics have made it unnecessary to restrict the sodium intake to the point that most waters used would be considered of major dietary importance.

Cholesterol-Fats, Diets and Atherosclerosis. Current concepts of lipid metabolism which may be of importance in elucidating relationships of dietary fats and serum lipid concentrations to the problem of atherosclerosis are reviewed. As a result of new concepts of lipid metabolism, new terminology has been created. Dr. Goldsmith explains the types of lipids, characteristics of fatty acids, and lipid transport, including several tables and figures. Many dietary substances, including fats and numerous other factors, influence serum lipid concentrations. Serum lipids which may be related in some way to atherogenesis include: cholesterol, specific triglycerides, phospholipids, fatty acids, and the whole spectrum of beta lipoproteins. A direct casual relationship between dietary fats, serum lipid concentrations, and atherosclerosis or coronary artery disease remains unproved. Many endogenous and exogenous factors other than diet influence atherogenesis. Obesity, hypertension, and hypercholesterolemia are associated with a high incidence of coronary artery disease. A therapeutic attempt to reduce high concentrations of cholesterol and other lipids in serum should be made as an experimental procedure. Until more information is available, it is impossible to recommend the fatty acid mixture or the total amount of dietary fat which may be desirable for the maintenance of health.

Saturated Fats. The word "saturated," when used in connection with fats, refers to carbon bonds of the fatty acids that make up the triglyceride esters known as fats or oils. Fatty acids that contain at least one double-bond in the carbon chain are referred to as unsaturated. Those in which the bonds between carbon atoms are single and the remaining bonds of the carbon atoms are bound to hydrogen are saturated. Vegetable oils, such as soybean oil, cottonseed oil, or corn oil, contain triglycerides made up of appreciable amounts of unsaturated fatty acids. These acids are oleic, with one double-bond; linoleic, with two double-bonds; and, in soybean oil, linolenic, with three double-bonds. In converting liquid vegetable oils to shortenings (hydrogenation), hydrogen is added to the double-bond. The fatty acids thus produced are then called saturated fatty acids.

JOURNAL OF THE DIETETIC ASSOCIATION (Victoria)

Vol. 12, March, 1961

*The Food and Agricultural Organization of the United Nations. J. McNaughton.—p. 4.

The FAO. The Food and Agricultural Organization (FAO) was the first specialized agency of the United Nations to be established after the end of the World War II. It came into being on October 16, 1945, when forty-one nations signed its constitution at a conference in Quebec. Another specialized UN agency of particular interest to dietitians and nutritionists is the World Health Organization (WHO). In the field of nutrition these two agencies work closely with the United Nations Children's Fund (UNICEF). In this paper, the aims of FAO, the ways it assists its member countries, how it is financed, and its structural organization are reviewed. The two major aspects of international nutrition work are the fight against protein malnutrition and the effort to improve nutrition education.

THE JOURNAL OF NUTRITION

Vol. 74, May, 1961

*Nutrition and longevity in the rat. III. Food restriction beyond 800 days. B. N. Berg and H. S. Simms.—p. 23.

*Magnesium requirement of young women receiving controlled intakes. R. M. Leverton, J. M. Leichsenring, H. Linkswiler, and F. Meyer.—p. 33.

*Effect of food restriction on tissue uptake and urinary excretion of Co^{60}-labeled cyanocobalamin by various animals. H. L. Rosenthal.—p. 65.

*Nutritive value of Maine sardines. II. Animal feeding tests. S. A. Miller, S. A. Goldblith, M. N. D. Goswami, H. A. Dymsza, and B. E. Proctor.—p. 70.

Nutrition and Longevity in the Rat. Observations on rats up to 1200 days old showed that food restriction to a level 46 per cent below that of rats fed *ad lib* resulted in an extension of life expectancy and a delay in the onset of major diseases, including neoplasms. With this amount of dietary restriction, little retardation of skeletal growth or sexual maturity was observed, and no storage of excess body fat developed as in the rats fed *ad lib*. In comparison with unrestricted rats, longevity of restricted animals was increased about 200 days in males and about 350 days in females. Life expectancy depended on the age of onset of lesions. With advancing age, the incidence of disease increased in both the restricted and the unrestricted rats, but number and severity of lesions remained lower in the restricted animals. Tumorigenesis was also delayed by dietary restriction but retardation was not as great as with other disease.

Magnesium Requirement for Women. Metabolism studies were conducted on thirty young women to determine their magnesium balances when they received a controlled standardized diet. The balances obtained in this study suggested that a daily magnesium intake of more than 280 mg. and perhaps as much as 320 mg. would have been needed to insure equilibrium in all of these young women. On the basis of reports in the literature and the results of this study, a magnesium requirement of about 300 mg. daily seems indicated for women.

Vitamin B_{12} and Food Restriction. The effect of food restriction on tissue uptake and urinary excretion of

cobalt-60-labeled vitamin B_{12} by various animals was studied. Adult female rabbits, subjected to total starvation, accumulated a higher percentage of injected cobalt-60-B_{12} in kidneys and eliminated more of the dose in urine than normal, well fed animals. Accumulation of the vitamin in liver was not altered under similar conditions. Chickens and rats responded to starvation to a lesser extent than rabbits, but guinea pigs failed to respond. Partial food restriction in rabbits resulted in progressive increases in kidney accumulation and urinary excretion of the injected vitamin as food intake decreased. It is suggested that some unknown factor necessary for the normal metabolism of vitamin B_{12} by the kidneys becomes limiting under conditions of total and partial food restriction.

Nutritive Value of Maine Sardines. Since an earlier investigation indicated that sardines were a good source of a number of nutrients, a study was initiated to determine the availability of sardine protein and fat for growth and maintenance of rats. No significant differences in growth, food and protein efficiency, or carcass composition were observed between rats fed a casein-lard control ration and animals fed either steam-cooked or fried sardines as a source of protein and fat. It was concluded that the protein and fat of sardines was sufficiently utilized by the rat for growth and maintenance and that steam cooking or frying prior to canning had no significant effect on the utilization of these nutrients.

THE JOURNAL OF PEDIATRICS

Vol. 58, April, 1961

*Cardiac findings in idiopathic hypercalcemia of infancy. W. J. Rashkind, R. Golinko, and M. Arcasoy.—p. 464.

*Dental caries experience of school children in Corvallis, Oregon, after 7 years of fluoridation of water. G. Tank and C. A. Storvick.—p. 528.

Cardiac Changes in Idiopathic Hypercalcemia. A case of idiopathic hypercalcemia of infancy is presented and fifty-three cases previously reported are reviewed. The cardiovascular findings in this patient at necropsy and in ten additional cases are summarized. A significant heart murmur was found in 63 per cent and hypertension in 43 per cent of the cases reviewed. Correlation of the clinical and pathologic observations suggests that the murmurs are due to pathologic changes involving the valves and myocardium. The importance of considering the diagnosis of idiopathic hypercalcemia of infancy in a child who fails to thrive and who has hypertension and/or a cardiac murmur is stressed.

Fluoridation and Dental Caries. Dental caries rates of the permanent and primary teeth for the children of Corvallis, Oregon, ages five to twelve years, were significantly reduced by seven years' exposure to fluoridated water when compared with the caries rate of children of the same ages who had been examined before fluoridation was initiated. A marked reduction in caries incidence also occurred in teeth which had developed before fluoridation of the water. A significant reduction was shown in the number of decayed and missing permanent teeth, decayed primary teeth, and teeth indicated for extraction. After fluoridation, more than twice as many children were free from caries in the permanent or primary teeth as had been before fluoridation. Although the maximum effects on the teeth of the children studied cannot be expected before twelve years of exposure to fluoridated water, the beneficial results which were apparent after only seven years are highly significant.

THE LANCET

No. 7181, April 15, 1961

Antagonism of insulin by albumin. C. Lowy, G. Blanshard, and D. Phear.—p. 802.

An insulin antagonist associated with plasma-albumin. J. Vallance-Owen and M. D. Lilley.—p. 804.

Insulin antagonism in the plasma of obese diabetics and prediabetics. J. Vallance-Owen and M. D. Lilley.—p. 806.

A new concept of diabetes.—p. 809.

No. 7185, May 13, 1961

*The relation between calorie intake and body-weight in man. A. M. Thomson, W. Z. Billewicz, and R. Passmore.—p. 1027.

Calorie Intake and Body Weight. Workers in America, South Africa, and England have not found much relationship between food intake and body weight in male and female students and in soldiers. Thus the evidence points clearly to the conclusion that, within the "normal" range of weights at least, increasing weight is not accompanied by much rise in food intake. Since the physiologic evidence that extra weight involves extra energy expenditure at rest and during exercise is incontestable, it follows that heaviness is generally associated with diminished physical activity. In obesity, sloth may be more important than gluttony. The reason why increasing weight appears to be associated with diminishing physical activity rather than with increased appetite is a problem for physiologic study. In public health, the question of what allowance, if any, should be made for the body weight of the subjects in assessing calorie needs seems to require reappraisal.

METABOLISM

Vol. 10, April, 1961

*Studies on the mechanisms of tolbutamide hypoglycemia. T. F. Shelley, T. F. Frawley, and E. J. Margulies.—p. 275.

*The nervous system and lipid metabolism of adipose tissue. II. Influence of denervation on the lipogenetic activity of adrenocortical hormones. M. W. Mazzucchelli, C. Confalonieri, and P. Schlechter.—p. 330.

Hepatectomies. Effects of intravenous sodium tolbutamide injections and intravenous insulin injection or infusion on peripheral glucose uptake were compared in dogs with porta-caval shunts and in hepatectomized dogs. The onset of tolbutamide hypoglycemia in porta-caval shunt dogs was not accompanied by an increased peripheral glucose uptake as measured by arteriovenous glucose differences in the leg. In the absence of the liver, however, the onset of tolbutamide-induced hypoglycemia was caused by an increase in peripheral glucose uptake. These results are interpreted as indicating that: in the dogs with porta-caval shunts, the presence of the liver modifies the hypoglycemic response to tolbutamide so that hepatic rather than peripheral glucose uptake increases. Furthermore, since the onset and characteristics of tolbutamide-induced hypoglycemia in the absence of the liver resembled that produced by insulin in the intact or porta-caval shunt animal, it is presumably mediated by tolbutamide-induced secretion of endogenous insulin.

Lipid Metabolism of Adipose Tissue. The lipogenetic action of cortisone and ACTH on the interscapular fat bodies was studied in normal, adrenalectomized, and hypophysectomized rats after one of these bodies had been denervated. In the normal animals, intramuscular administration of cortisone every 12 hr. did not influence lipid mobilization from these fat bodies during fasting, but did facilitate lipid repletion during re-alimentation. This effect of cortisone was independent of the dose, and the denervated fat body was affected in the same manner as the normally innervated one. Adrenalectomy or hypophysectomy led to a decrease in the lipid content of the interscapular fat bodies that was prevented by cortisone administration or, in the hypophysectomized animals, by intramuscular injections of ACTH. Denervation did not significantly influence these findings. It is concluded that cortisone, and probably the other glycocorticoids produced by the adrenal cortex, possesses a lipogenetic activity that is probably secondary to the increased glycogen synthesis it causes.

NATURE

Vol. 4774, April 29, 1961

*Malnutrition. W. R. Aykroyd.—p. 398.

Malnutrition. "The Place of Food Science and Technology in the Campaign against Malnutrition" was a topic of a London meeting of the Nutrition Society. Attention centered on malnutrition in children in the toddler stage. Lack of protein and calories is the most common cause of malnutrition in countries where the supply of foods of animal origin is low. Representatives from India, Iraq, Pakistan, and Ghana outlined the background of their countries' problems and described feasible methods for making diets more satisfactory. Because of finances, protein must be obtained from plants rather than from animals. Lack of vitamin B_{12} in plant proteins might be corrected by fortification with the synthetic vitamin. Throughout the meetings, the great

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1. Mosovich, Luis L., Pessin, Vivian and Lowe, Charles U.; Effects of Milk Composition on Baby Composition, AM. J. Dis. Child. 100: 791-792, 1960. 2. Adam, Doris J.D., Hansen, Arild E. and Wiese, Hilda F.; Essential Fatty Acids in Infant Nutrition, J. Nutrition 66: 555-564, 1958. 3. Food and Nutrition Board, National Academy of Sciences—National Research Council, Washington, D.C. (Revised 1958)

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need for popular education in nutrition was stressed as a necessary corollary to all other measures to eliminate malnutrition. The solution lies in more research and in an understanding of the complex factors which cause malnutrition.

NEW ENGLAND JOURNAL OF MEDICINE

Vol. 264, May 4, 1961

*Depression of food intake induced in healthy subjects by glucagon. S. B. Penick and L. E. Hinkle, Jr.—p. 893.

Food Intake and Glucagon. With the use of a random double-blind procedure, 110 experiments were carried out with eight healthy medical students to compare the effects of glucose (100 gm. by mouth), glucagon (1 mg. intramuscularly), and a placebo on food intake. Neither glucose nor glucagon had any significant effect on the food intake of the subjects half an hour after administration, even though both produced significant elevations in the absolute blood glucose concentration and in the arteriovenous blood glucose difference at such times. Glucagon, but not glucose or the placebo, produced a significant reduction in the food intake at test meals. This effect was delayed, beginning 1 hr. after administration, reaching a peak at 2 to 3 hr. and continuing for 5 hr. The mean depression of caloric intake was 30 per cent below the mean control level. The administration of glucagon occasionally caused moderate nausea and some complaints of anorexia, but there was no consistent relationship between the occurrence of these symptoms and the depression of food intake.

NEW YORK STATE JOURNAL OF MEDICINE

Vol. 61, April 15, 1961

Present status of the oral hypoglycemic agents. M. G. Goldner and S. Weisenfeld.—p. 1328.

*Metabolism of body fat. S. A. Hashim.—p. 1339.

Vol. 61, May 1, 1961

*Diabetic neuropathy. M. Ellenberg.—p. 1562.

Metabolism of Body Fat. The various factors influencing lipogenesis and mobilization of fat from adipose tissue are summarized. Hormones merely regulate the rate at which metabolic events occur within cells. The net effect which any one hormone plays in the regulation of the flux of fat in adipose tissue of the intact organism remains unknown. In view of the importance of the subject of lipid mobilization and lipogenesis in the scheme of knowledge about metabolism, it is surprising that investigation in this area has lagged until recently. Adipose tissue, whose function once was thought to be limited to storing dense calories, is indeed capable of partaking in a variety of metabolic processes characteristic of living tissue and also of responding to humoral and autonomic stimuli.

Diabetic Neuropathy. One of the more frequent and yet one of the more neglected aspects of diabetes is the involvement of the nervous system. The treatment of diabetic neuropathy, unfortunately, leaves much to be desired. Although many claims have been made intermittently for the various components of the B-complex individually and in combination, our experience indicates that they contribute nothing to the course of this disease. The same disappointment has followed the use of other suggested therapeutic agents, such as saline, phenothiazine derivatives, and so forth. General symptomatic measures, including warmth, good nutrition, relief of pain, and proper diabetic control, are indicated.

NUTRITION REVIEWS

Vol. 19, May, 1961

*Nutritional research in the Soviet Union. I. Some general aspects. J. Brozek.—p. 129.

Nutritional Research in Russia. This brief review deals with metabolic research in the U.S.S.R. It is apparent that metabolic research has not been the strongest point of the Soviet biologic sciences. Nutritional research is centered in three cities: Moscow, Leningrad, and Kiev. The most important center is the Institute of Nutrition in Moscow, a part of the Academy of Medical Sciences. At present, this Institute guides and coordinates nutritional research in the Soviet Union. Other top ranking establishments concerned with nutrition are mentioned. The bimonthly periodical in which most of the nutritional research is reported is *Voprosy Pitaniya* (Problems of Nutrition). A useful source of information on current research is the *Proceedings of the Scientific Sessions* held each year in the spring at the Institute of Nutrition in cooperation with other research establishments. Though limited, the British *Nutrition Abstracts and Reviews* provide the best English coverage of the Soviet work on nutrition. The nutritional implications of the six-year plan (1959-1965) for further development of the national economy are given. One problem emphasized as a research topic is adaptation to stresses in general and acclimatization in particular.

PROCEEDINGS OF THE SOCIETY FOR EXPERIMENTAL BIOLOGY AND MEDICINE

Vol. 106, April, 1961

*Cholesterol content of human liver after feeding of corn oil and hydrogenated coconut oil. I. D. Frantz, Jr. and J. B. Carey, Jr.—p. 800.

Effects of Different Fats on Liver Cholesterol. Three oz. corn oil daily were added to the diets of six men for one month. Three oz. hydrogenated coconut oil daily were added to the diets of a similar group of control subjects. Serum cholesterol concentration fell an average of 9 per cent in the men fed corn oil, but did not change significantly in the controls. Liver cholesterol concentration, as measured by liver biopsy, fell an average of 25 per cent in the men fed corn oil. No consistent effect was observed in the controls. It is concluded that the fall in serum cholesterol produced by corn-oil feeding in man is probably not due to a shift of cholesterol from the blood to the liver.

PUBLIC HEALTH REPORTS

Vol. 76, May, 1961

*Typhoid fever epidemic following a wedding reception. C. T. Caraway and J. M. Bruce.—p. 427.

Typhoid Fever Epidemic. In southern Louisiana, thirty-one cases of typhoid fever developed among eighty-eight persons who ate chicken salad sandwiches at a wedding reception. One of the women who prepared the sandwiches was discovered to be a typhoid fever carrier. The same Vi bacteriophage type E1 of *Salmonella typhosa* was isolated from the carrier and all of the patients yielding positive cultures. Comparison of attack rates for those who had been vaccinated and for those who had not, indicated that no protection was afforded by the typhoid vaccine.

SCIENCE

Vol. 133, June 2, 1961

*Strontium-90 and cesium-137 in North American milk. J. L. Kulp, A. R. Schulert, E. J. Hodges, E. C. Anderson, and W. H. Langham.—p. 1770.

Strontium-90 and Cesium-137 in Milk. The strontium-90 and cesium-137 concentrations in powdered milk in North America vary roughly with the specific activity of rain. The strontium-90:cesium-137 ratios in over eight hundred samples of powdered milk taken from sixty stations in North America from 1957-60 have a standard deviation of only 44 per cent. Thus, a single determination of the cesium-137 content of a randomly selected powdered milk sample in the U. S. will give the strontium-90 concentration well within a factor of two in accuracy at the 95 per cent confidence level. Such accuracy is entirely adequate for large-scale monitoring purposes.

SOUTH AFRICAN JOURNAL OF LABORATORY AND CLINICAL MEDICINE

Vol. 7, March, 1961

*Controlled field trial of a bread diet supplemented with lysine for children in an institution. L. H. Krut, J. D. L. Hansen, A. S. Truswell, H. E. Schendel, and J. F. Brock.—p. 1.

Plasma cholesterol values of urban Zulu adults. S. M. Joubert, C. Slome, J. H. Abramson, B. Gampel, and N. Scotch.—p. 35.

Bread Supplemented with Lysine. The effect of lysine supplementation of bread was studied in children at an institution in Cape Town. Lysine supplementation of a diet in which bread provided 88.8 per cent of the protein and 52.4 per cent of the calories was beneficial for young children as assessed by serum albumin concentration and body weight, when com-

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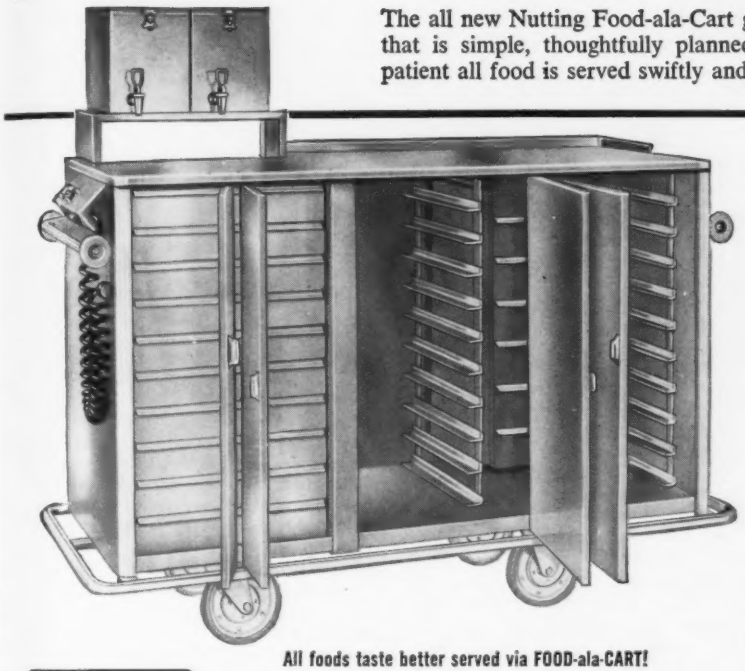

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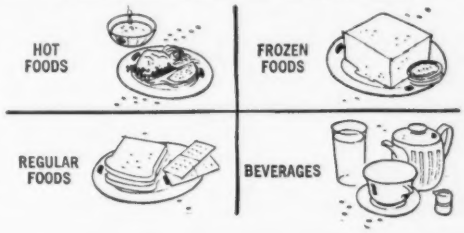

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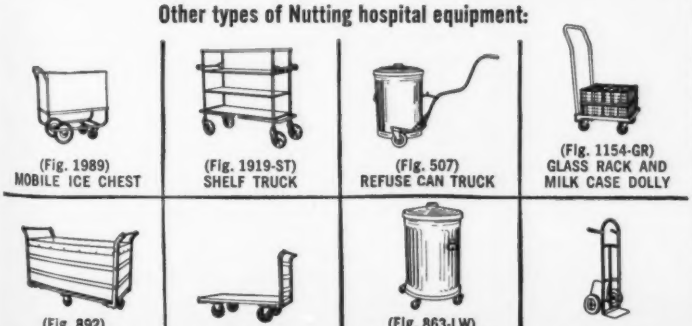
(Fig. 1989) MOBILE ICE CHEST
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(Fig. 1154-GR) GLASS RACK AND MILK CASE DOLLY
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pared with controls receiving an isonitrogenous glycine supplement. The effect of lysine cannot be ascribed to a greater protein intake, nor did it show any appetite stimulation in the amount and manner given. The effect of lysine was presumably to improve the biologic value, and therefore the utilization, of the wheat protein. This bread of low-protein content (6.4 per cent) was unsuitable as the principal protein source in the diet of young children.

AMERICAN RESTAURANT

Vol. 45, May 15, 1961

*Your menu is your blueprint for charting work schedules. T. Greer.—p. 49.

Your Menu. Using the rotating or cycle menu, a production and planning guide is developed. Requisitions are part of the production plan and cover these areas: (a) storeroom staples, (b) refrigerated or perishable foods, (c) bake shop, (d) vegetable preparation, and (e) laundry. A suggested requisition form is included.

COLLEGE AND UNIVERSITY BUSINESS

Vol. 30, April, 1961

*Centralized food service rates student praise at Brigham Young. W. P. Cloward.—p. 67.

*The campus kitchen of the future. T. W. Minah.—p. 82.

Vol. 30, May, 1961

*Food service management by outside contract. G. Shuman, Jr.—p. 91.

Centralized Service. A total of 1700 students take advantage of the new food service facilities at Brigham Young University, Provo, Utah. There are two dining rooms in Cannon Center, as well as a snack bar and a patio for outside dining service. Three cafeteria lines are used, and students bus all their dishes to a central point. Floors throughout are of quarry tile, walls often of structural glazed tile. The building is the hub of a total centralized food service—there are five other feeding units plus the catering, concessions, and food vending machines. Equipment and layout are described.

Future Campus Kitchens. Coming changes in college food service are dealt with from the following standpoints: (a) purpose of the campus food services (relation to cultural and educational atmosphere); (b) management phase of the operation (studies of traffic peaks, profit and loss, employee training and duties, equipment, and so on); (c) atmosphere of dining halls (decor); and (d) the long-range plan.

Food Service by Contract. Food service objectives must be determined before management by outside contract is considered. Four types of contracts are listed: (a) a fixed rate per student per semester—at the operator's risk; (b) a management fee (cost plus a dollar fee); (c) an income-producing clause (such as 5 per cent of cash sales); and (d) a fixed rate per week. Nine advantages of outside food service management are cited.

THE CORNELL HOTEL AND RESTAURANT ADMINISTRATION QUARTERLY

Vol. 2, May, 1961

*Ideas are food for thought in food service planning. O. E. Bangs.—p. 8.

*Modern food service design and equipment.—p. 28.

*Lighting affects your effect. C. I. Sayles.—p. 36.

*In defense of American food. L. E. Bond.—p. 47.

*Traffic flow: good layout cuts costs. A. C. Avery.—p. 51.

*Dish pantry design: an economic solution. N. F. Schneider.—p. 61.

*Dishroom renovation. N. Sharaf.—p. 67.

*Method and motion studies. A. W. Dana.—p. 71.

*The architect views the food service consultant. G. Kassabaum.—p. 76.

*No more kitchens? A symposium.—p. 82.

*Controlling bacterial growth.—p. 98.

Successful Food Service Planning. The first requisite for a successful restaurant is an informed management. Foresight during preliminary programming and planning can save hundreds of dollars in construction and food costs and thousands in operating costs. Eight basic steps are outlined for the over-all development of a project, stressing the importance of establishing objectives and preparing a prospectus. Basic factors to success of a food service operation include: organization, location, market potential, menu, physical set up, personnel, and maintenance. Each factor is discussed in detail.

Modern Design. A floor layout is shown for a cafeteria serving 2000 employees of a typewriter plant. A special feature is four portable food bars for conveying food to the plant area. Photographs highlight certain features of the plan, such as the shopping center serving area; kitchen areas, such as those for vegetable and salad preparation; the roast, broil, and fry-cooking areas; and dishwashing and scullery areas.

Lighting. A lighting display is described in which "white" light sources and their effects on decor and foods were observed. Men preferred incandescent, warmtone fluorescent, and soft fluorescent lights. Women placed incandescent first, followed by soft and then warmtone fluorescent. It was also found that residents of warm climates preferred the "soft" and "cool" fluorescent "white" lamps rather than the types preferred in this study. Here is dramatic evidence that different fluorescent tubes produce different colors, altering the appearance of decor and food and affecting patrons' moods.

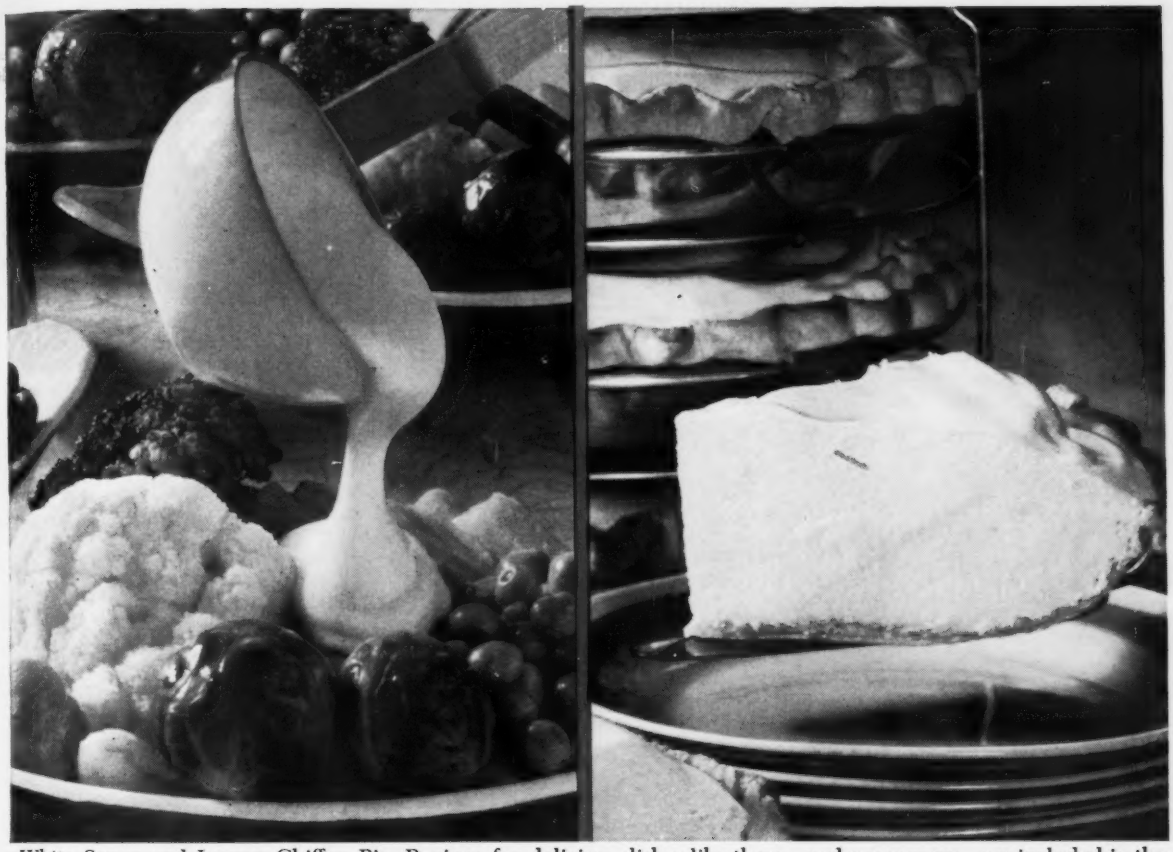
Defending American Food. "American cuisine" is, in part, an admitted adaptation and blending of the desirable elements in the world's cookery. Yet, it can stand on its own feet. Nowhere else in the world can the quality and variety of fresh foods be matched by what is found in our supermarkets. Purchase by specification indicates improved procedures. The roles of the dietitian and chef are evaluated, and the new key-man, the college-trained recruit from a school of hotel and restaurant administration, is introduced.

Food Service Layout. The industry has endeavored to follow the factory-type production pattern: receiving, preliminary processing (the building of small components), main processing, assembly, and delivery. Diagrams and illustrations indicate that this set-up is most unsatisfactory. What is needed is a layout where food travels the shortest possible distance from receiving to service and the labor performed involves a minimum of walking and unproductive effort. Again, diagrams and illustrations show how this can be accomplished. Also considered are methods for determining work patterns and factors involved in efficient work flow (receiving and storage, preparation, kitchen layout, equipment and utensils, and serving lines).

Dish Pantry Design. Traditional design methods are not always the most economic. Following a description of the types of dishwashing machines available today, typical steps in the dishwashing cycle are listed. Operator rates for various dish maintenance operations are given. Dishwashing costs are included (such as those for labor, depreciation of the machine, maintenance of the machine, detergent, rinse-drying agent, water, tank temperature, maintenance, space, and dish storage). This information, plus data on restaurant characteristics, suggests that two general approaches to the program are possible. The dish pantry may be designed to handle the pieces as they arrive—the peak hourly method—or so that all pieces will be cleaned within some longer time—the spread work load method. Cost evaluation indicates that the spread work load method is the most economical.

Dishroom Renovation. Up-dating a dishroom system calls for thought and study. In this case, the first step was a change from dish removal at the tables by bus girls to self-bussing. The scraping operation takes place at a specially designed stripping table. A horizontal conveyor-type dishwashing system is used. The handling of silverware is described. The change in system has met with approval of both patrons and employees, and operating costs have been reduced. Dishes of sixty-five patrons are washed per manhour employee. The process is completed by people who are no longer classified as "dishwashers" but as cafeteria employees and has resulted in the elimination of job classifications.

Method and Motion Studies. Within the restaurant, the dishwashing department comes closest to resembling factory operation as far as applying the principles of time-and-motion study. Three principles of motion



White Sauce and Lemon Chiffon Pie. Recipes for delicious dishes like these—and many more—are included in the free Carnation Instant booklet offered below.

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economy are given, and diagrams show the techniques of tray wiping, dish loading and sorting. The handling of small plates, bowl-type dishes, sauce dishes, and silverware is outlined, too.

The Architect and Food Service Consultant. The architect's basic responsibility is to analyze the significance of the building he has been asked to design and to provide the proper environment for this meaning. The food service consultant has more to offer than a knowledge of equipment, procedures, processes, and efficiency—the same aesthetic and environmental considerations apply. The relationship of the two specialists should be found in teamwork, giving the chance to be stimulated from an intimate but outside source. Such an approach will be creative. Proper choice of materials will result in a kitchen which is more than an uninspired, antiseptic environment of sterility. Function plus beauty can't help but inspire the production of superior food.

No More Kitchens? Articles in the trade press and expressed opinion lead one to believe that the days of the quantity food kitchen are numbered. Industry leaders were asked to answer five questions related to such a change. Their answers, as presented, indicate that the quantity kitchen is in for further changes, but will not disappear in this century.

Controlling Bacterial Growth. There are six links in the chain of bacterial growth: unsanitary food, transportation vectors, nutrient, temperature, time, and ingestion. Temperature is the best factor to control, and time is next. Thus, small-batch cooking for immediate service is recommended. Rapid cooling of food for storage is another essential precaution. As for leftovers, "When in doubt, throw it out." Clean hands, clean utensils, and clean working equipment are musts if bacterial growth is to be controlled.

DRIVE-IN MANAGEMENT

Vol. 20, May, 1961

*What you should know about buying equipment. L. H. Kotschevar and M. Terrell.—p. 46.

Buying Equipment. Whether equipment is custom built or standard stock, selection must be determined in relation to essentiality, cost, performance, production requirements, safety, sanitation, appearance and design, and general utility factors. Each point is elaborated upon.

FOOD ENGINEERING

Vol. 33, May, 1961

*Point up freeze-dry phenomena. J. H. Nair.—p. 57.

*Ingredients—developments briefed.—p. 85.

*Latest starches—How they are used. O. B. Wurzburg.—p. 95.

*World malnutrition challenges America. C. G. King.—p. 111.

Freeze-Dry Conference. An international technical conference on critical factors involved in freeze-drying was held in Chicago in April. Points made by the various speakers are summarized. The advantage of freeze-drying is attributable to prevention of shrinkage and of chemical change as well as avoiding development of insolubility. Causes of deterioration were discussed, as were many of the technicalities of the process.

Ingredient Innovations. Over twenty developments which will increase food processing efficiency are highlighted. Natural fruit cells are the latest citrus flavorings for ice cream, sherbets, soft drinks, and confections. Dehydrated citrus peel (used in orange muffin mix) is protected from oxidation by processing that retains natural flavor and nutrients. Microcrystalline cellulose is a new ingredient for scientific control of nutritive and caloric contents of baked goods, frozen desserts, whipped toppings, and so on. Safflower oil, highest in linoleic acid content of any commercially available oil, may be used as an ingredient of margarine and mayonnaise. Food-coating agents; dry spice seasonings; liquid shortening; a high-protein supplement derived from soybean; ice cream stabilizers; shrimp and lobster powders for soups, cocktail spreads, and the like; and nutritive glazes for nutmeats and confections (to retard rancidity and moisture pick-up) are other ingredients described.

Starches. The properties of starch vary, depending on the form of the starch—the dry granule or powder, the swollen granule, starch molecules in solution, and the dried film. Actual and potential properties of each of these forms are described. Application of new forms has resulted in such items as a molding powder for gum candies, cooked starches that may be held at near-freezing temperatures without weeping, starch molecules capable of acting as stabilizers to colloidal systems and as emulsifiers, and starch films as edible surface coating on foods.

Challenge of World Malnutrition. The most damaging form of malnutrition is the protein deficiency that occurs in the age range of six months to four years. It is found in Central and South America, the Caribbean Islands, Africa, the Near East, India, and Southeast Asia. Typical diets of these areas are described. Exciting programs to overcome the problem are being carried on in Mexico, Central America, and India. These projects give impetus to the nutritional challenge that confronts us.

FOOD SERVICE MAGAZINE

Vol. 23, May, 1961

*Put spring on your menu. J. Rock.—p. 44.

*You can't afford to wash linens. J. Carlson.—p. 60.

Vol. 23, June, 1961

*7 kitchen labor savers. M. Bernatsky.—P. 33.

*Let's glamourize potatoes. J. Rock.—p. 39.

*Cheese from soup to dessert. J. F. Brookman.—p. 44.

*Preparing fresh vegetables the modern way. M. W. Neale.—p. 47.

Salads. Clean, cold, crisp ingredients are the basics of a manageable, beautiful salad. There are no excuses for greens, knife-cut by the handful (they should be broken or torn); or for damp greens (unless perky, dry, and crisp, they look and taste drowned under too much dressing). It takes a cultivated eye—for symmetry, shape, color, and arrangement—to build a good looking salad. Three salads are described—Calcutta, chicken Hawaiian, and outrigger.

Restaurant Laundry Business. One Chicago restaurant has solved its linen problem by getting out of the laundry business. A linen service purchased the entire stock of linens and agreed to take over the whole problem of damask table cloths and napkins, waiters' jackets, kitchen aprons, dresses, and dish towels. Advantages are neater, fresher linens, and an increase in the size of the average customer's check. Linens are supplied daily except Sunday. Details, including cost analysis, are given.

Kitchen Labor Savers. Seven pieces of equipment are pictured and discussed because they qualify as both labor-saving and functional. Included are: pass-through refrigeration, rotary ovens, juice dispensers, flight-type dishwashers, mobile carts, steam cleaners, and the electronic range.

Glamorizing Potatoes. Since different varieties of potatoes have been produced for specific purposes, it is essential that purchasing be done intelligently. Too often, a menu relegates the potato to the standard forms—whipped, French fried, or baked-in-foil. What about variations such as Potatoes Anna; hashed-in-cream potatoes from diced, *raw* potatoes; mashed potatoes and yellow turnip; oven-browned potatoes; *pommes soufflé*, and potatoes boiled in consommé? Other innovations are mentioned, including left-over mashed potatoes with nuts.

Cheese. As public eating tastes become more sophisticated, it pays to make cheese available in every part of a restaurant menu. Foods for appetizers are Swiss, Cheddar, bleu, and Gouda. Cheddar cheese soup can become a specialty. A recipe is included for "Many Way Cheese Spread." Salad garnishes include grated Parmesan, Cheddar cheese cubes, Swiss cheese julienne, and cottage cheese. For dessert, a cheese tray should include some sharp cheese, some mild, some soft, some semi-hard, and some unusual kinds with distinctive flavor. Cheese sauce for fruit pie is another possibility.

Modern Vegetable Preparation. Automatic equipment for preparing vegetables saves not only time and labor, but also ingredient costs by yielding more slices to the pound and reducing waste. There are two main types of cutting machines—one designed mainly to slice and shred, the other to slice, shred, cut French fries and shoestring potatoes, and dice uniformly on one

3 friendly ways to put

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pass through. Various operating principles are represented by different brands. After figuring out the type of vegetable cutting jobs important to one's own set up, demonstrations are in order. The variety of equipment available is described, including special electric French-fry cutters; attachments for mixers; bowl-type food cutters; meat choppers and slicers; and peeling machines.

FROSTED FOOD FIELD

Vol. 32, May, 1961

*The microbiology of frozen foods: I. R. P. Elliott and H. D. Michener.—p. 26.

*Nutrition and seafood—a great opportunity. F. J. Stare.—p. 29.

*Frozen turkeys: spur to year-'round sales. S. Borden.—p. 40.

Microbiology of Frozen Foods. Reported here is a survey of the literature on the microbiology of chilled and frozen foods. No reports were found of food poisoning bacteria that can grow at temperatures below 40°F. However, psychrophiles can grow at much lower temperatures. This means that there is a temperature zone above and below the freezing point where spoilage can occur without production of toxicity or infectious doses of microorganisms. The danger from food poisoning lies in the grossly mishandled product, whether before freezing, during distribution, or in the hands of the homemaker. Survival data for the various organisms are given.

Nutrition and Seafood. The introduction to this article is an explanation of the six components of food (protein, fat, carbohydrates, minerals, vitamins, and water). The value of fish in the total picture is presented, and the need for more recipes using fish is stressed. Factors influencing atherosclerosis are discussed. Fish fat as a source of polyunsaturated fats ties in with this problem.

Frozen Turkeys. A good meat buy in the super-market is the 4- to 8-lb. Beltsville, or fryer-broiler turkey. Its value as a meat feature is elaborated upon, and its potential discussed, since year-round buying of turkeys shows the popularity of the smaller bird.

HOSPITAL MANAGEMENT

Vol. 91, April, 1961

*How to increase food service efficiency. Sister M. Brigid.—p. 50.

Increasing Efficiency. The best labor utilization comes from such activities as pre-training, pre-packaging, pre-assembling, and pre-proportioning. Suggestions are given for pre-packaging silverware, napkins, salt, pepper, and sugar for tray service, reducing eight operations to one. Bread bagging and individual jelly, sauce, and sirup containers are examples of pre-packaged items. Pre-assembled cold food on trays in refrigerated carts are a mark of efficiency. All these operations may be performed during slack hours. Food preparation is eased by use of such items as precooked breaded chicken fillets—these and several other new chicken items are listed with use, size, and cooking instructions.

HOSPITAL PROGRESS

Vol. 42, May, 1961

*How patients rate hospital food service. Sister R. Genevieve.—p. 146.

Rating Hospital Food Service. A survey was conducted in St. Louis to determine food acceptance by the patient. Ten copies of a questionnaire were distributed at each of eight hospitals. Seventy-six of these were returned, representing both modified and general diets. Results indicated that most patients liked hospital food; the majority had not been visited by the dietitian. Indicated here is the need for the dietitian to take more seriously her obligation of teacher, helping patients to change their attitudes toward food and food habits where necessary.

HOSPITALS

Vol. 35, May 1, 1961

*A guide for inspection of perishables. L. L. Good.—p. 68.

Vol. 35, May 16, 1961

*Quality control in poultry and egg purchasing. A. E. Handy.—p. 74.

Inspecting Perishables. The need for inspecting perishable foods is reviewed. The "how" of conducting an inspection is described (including equipment to be used). Specific information is given for fresh and frozen meats, poultry, fish and seafood, eggs and dairy products, fresh fruits and vegetables, and frozen fruits and vegetables.

Poultry and Egg Purchasing. Many hospitals are using the acceptance type of federal-state grading service designed especially for quantity buyers. Arrangements for the service may be made by applying to one of the 600 U.S. Department of Agriculture poultry grading stations and offices. Buyers purchase poultry and eggs on a bid basis and can have the products examined for compliance with their specifications. Acceptance stamps are illustrated, grades of stewing chickens, young chickens, young hen turkeys, and eggs are pictured. Poultry grading is discussed, including Procurement Grades I and II, designed for buyers primarily concerned with the meat yield of poultry rather than its appearance. Egg specifications are discussed, also.

INPLANT FOOD MANAGEMENT

Vol. 8, May, 1961

*What's ahead in efficiency products? W. A. Raleigh, Jr.—p. 40.

Efficiency Products. A year from now hundreds of high quality, completely ready or near ready foods will be available. Products will be tailored to various institutional markets; packers will be increasingly conscious of specific needs in determining kinds of items and the size of portions. The same food item will be offered in three size-portions (for sandwich, table d'hote, and à la carte service). Instruction for use will be improved. Savings up to 50 per cent in institutional food preparation can result from use of "heat-in-the-bag" frozen prepared foods. Efficiency foods produced by several of the large companies are described and equipment of various manufacturers for reheating these products is covered.

INSTITUTIONS

Vol. 48, June, 1961

*Calorie control in the kitchen.—p. 37.

*How much room does seating take?—p. 62.

*Electronic security systems.—p. 93.

*Don't speculate when specifying equipment.—p. 124.

*Receiving . . . the place where kitchen control begins. R. F. Lukowski.—p. 128.

*School lunch management. Part VI. S. M. Hartt.—p. 143.

Calorie Control. Many food service operators have shied away from serving dietetic foods, fearing the cost would be prohibitive. Actually, in most cases no special foods are necessary. New customers and increased profits can be had with few modifications in present recipe formulas and serving methods. A guide is included for determining the caloric content of familiar foods. Hints are given for a "weight watcher's breakfast."

Seating Room. An illustrated chart gives data on seating space (luxurious, intermediate, and economical) required by various size chair and table units, and by booths.

Electronic Security Systems. The new low-cost security systems available can reduce the number of guards required in an institution and save in salary expense. The first step is to determine what areas should be protected. For most situations, a combination of the perimeter before-entry protection and interior after-entry surveillance is best. The major types of systems are fence, audio, sonic, light, electromechanical, capacitance, radar, and television.

Equipment Specifications. Part I of this article deals with general conditions (instructions to bidders) which apply to all the equipment purchased. This usually involves an itemized schedule of equipment listing the unit price of each item, identifying the item by name and number as given on the plan and specifications. General conditions should also clarify the relationship of the owner, architect, contractor, sub-contractors, and material men to each other. Work and pay schedules, working conditions, delivery and shipment conditions, alternate bid acceptability, and other information related to equipment and layout should be defined. The second section deals with the specification checklist.

Kitchen Control Begins with Receiving. Three types of receiving methods are reviewed—invoice receiving, blind check receiving, and partial blind receiving. Blind receiving is the most accurate method of checking merchandise since the clerk does not know the

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ALL of the items necessary for a complete food service system — from start to finish — are available from Swartzbaugh. Mechanically Refrigerated cold food loading tables specially designed for handling plated salads, desserts, butter, etc., and hot food loaders with built-in flexibility combine with tray set-up unit, dish lifters and conveyor line to provide you with a fast, efficient food serving system — all from one source.

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amount ordered and must check each item (the invoice must not accompany the merchandise).

School Lunch Management. The method of cash reimbursement for Type A school lunches, as handled by state agencies, is explained. Distribution of agricultural commodities and other foods given to the schools under the School Lunch Act is handled by the Secretary of Agriculture. The authorized agency within the state notifies the school of the availability of the food and the way in which it is packaged. The school makes out a request form for the food needed, pays the delivery charges, and is responsible for safe storage of the food.

THE MODERN HOSPITAL

Vol. 96, May, 1961

*Dietary policies help workers start and stay. S. J. Soltis and K. D. Spencer.—p. 120.

U.S.D.A. unscrambles egg buying: provides a standardized grading service. E. A. Handy.—p. 126.

*Dietary practices often differ from accreditation standards. J. Hartman.—p. 128.

Dietary Policies. At Beckley (West Virginia) Memorial Hospital, a favorable work climate has been developed through application of certain personnel policies. First, there are written policies which apply to all services within the hospital. Within the dietary department, there are thirteen classifications, three being professional positions. The indoctrination and orientation program for food service workers requires 8 hr. intensive training (the check list for induction is included). Continued training, performance review, and a grievance procedure are also part of the program.

Practice and Accreditation Standards. The official standards of the Joint Commission of Accreditation of Hospitals as related to dietary departments are set forth. The nine most common faults reported by surveyors are included as well. Among them are lack of thermometer and temperature controls in large refrigerators and on dishwashers; storage of uncovered foods and drugs in the same refrigerator; failure to clean ice storage bins; unimaginative, unpalatable diets; and poor food transportation.

PERSONNEL JOURNAL

Vol. 40, May, 1961

*If you are overworked. L. J. Cantoni and L. Cantoni.—p. 12.

*The older worker's contribution to his own unemployment. J. A. Metzger.—p. 19.

Being Overworked. If we are to maintain our individuality, we must be concerned about ourselves as well as others. Following self-scrutiny and pinning down the major issues at stake in a situation that is too demanding, certain steps must be taken: (a) do what you have planned to do; (b) remain calm and polite; (c) be decisive, making no apologies; (d) take only one step at a time; and (e) reevaluate after each step.

Older Worker's Unemployment. Regardless of age, the individual has a degree of influence in his unemployment, whether it be through economic adversity, individual decision, or industrial discipline. Education is becoming increasingly important, and cost of employment necessitates the selection of the best qualified applicant (technically, mentally, and physically). It is more imperative than ever that older persons prepare themselves for the eventuality of unemployment by keeping aware of trends in the industrial economy, being willing to accept change, and training for such change.

RESTAURANT MANAGEMENT

Vol. 88, May, 1961

*Vignettes of restaurant history: Count Rumford—equipment specialist. D. E. Lundberg.—p. 72.

*How I solved my grease trap problem. A. Steinberg.—p. 95.

*Glass panels, an answer to food-warming problems.—p. 96.

*Then—now: commercial kitchen ventilation.—p. 114.

Vignettes of Restaurant History. Achievements of two men in this field of food service are cited. Count Rumford (Benjamin Thompson) studied the ways of combustion and designed roasters, stoves, pots, and pans to absorb the maximum amount of heat from the fuel. Living at the time of the American Revolution, he also invented steam-jacketed kettles, the double boiler, and a "drip" coffee pot. He also anticipated kitchen planning—his large ranges for military hospitals were oval in shape. . . . About 1910, a little known genius, Fred Baudissin, developed the first full-fledged food cost control system. He believed in quality food, small inventories, invoices with all deliveries, and strict controls in the kitchen.

Grease Trap Problem. One restaurant whose new waste disposal system and drainage field were designed and built by a top architect and an expert sewage engineer could not overcome the problem of a persistent odor and sogginess over the restaurant grounds. Periodic cleaning of grease traps and septic tanks by an outside firm did not solve the problem. Finally, a new, noncaustic, waste system chemical was tried. The procedure is described. Used for two years, it has completely solved the problem.

Glass for Food Warming. Glass is characterized as a slow conductor of heat (it transforms warmth to food at a rate equal to the radiation and convection of heat out of the food as it cools, so that servings remain at an even temperature without burning or drying out). Hot glass will not burn if you touch it (the rate it transfers heat to the skin is slow enough to give time to pull away as soon as you sense the heat). Glass heating panels absorb heat, thus warmth is even and given off steadily. Maintenance is simple, the glass needing only to be wiped clean with a damp cloth. The use of glass heating panels as food warmers in three restaurants is described.

Kitchen Ventilation. Here is a guide to ventilation system design for a modern commercial kitchen. Considered are exhaust hoods (both "ventilator" and canopy), grease filters, exhaust air volumes, the effect of gas appliances, fresh air supply, exhaust ducts, exhaust fans, auxiliary electrical and fire control devices, and kitchen heat gain due to hooded cooking appliances.

VOLUME FEEDING MANAGEMENT

Vol. 16, May, 1961

*Menu plus design equals profit. 2nd prize winner.—p. 29.

*How to pre-test new food products in a hospital.—p. 44.

*How to pre-test new food products in a cafeteria.—p. 46.

*Fresh fruit. E. Blair.—p. 144.

*Chilled soups . . . "pottage du jour" all summer.—p. 154.

Hospital Design. The proposed hospital food service facilities described here were presented by a student of the food facilities engineering courses at Cornell University's School of Hotel Administration. Menus for a week, floor plan and equipment, and description of the hospital set-up and procedures are included for a 300-bed institution. Judges' comments are included.

Pre-Testing New Foods in a Hospital. Here is an example of how new food products are introduced through pre-test market trials. The article describes how the manufacturer presented twenty-six frozen food entrées to his distributor, how the distributor presented them to the operators, and how the operators (in this case a hospital dietitian and chef) prepared them for patients. Single-service entrées were rejected because of time involved in opening single packs. Steam kettle, steamer, and oven were used for reheating (method depending on the product). Fish dishes were excellent, but one product was too large a portion for hospital patients.

Pre-Testing in a Cafeteria. Photographs illustrate how the frozen food entrée, stuffed cod, was introduced in a cafeteria set-up. Advantages of the product were high quality, as much built-in labor as possible, and easy serving with existing equipment.

Fresh Fruit. Menus offering fresh fruit are hard to find, yet the advantages of featuring these items are many—adding prestige and bringing better prices. Arranging an assortment of whole fruit on a small tray with cheese, or in a footed compote is worth considering. Fruit cup combinations, fruit scattered over a mound of shaved ice, and strawberries in a wicker basket lined with leaves are just a few of the suggestions given. Varying the sweetening is possible too; garnishes add glamour.

Chilled Soups. Summer calls for chilled soups—whether they be jellied clear soup, iced salad soups, or cream soups. Hints for all these types are given, and over fifteen interesting garnishes are suggested.

You can make news with *distinctive seafoods*

Build sales with oysters, scallops or bite-sized fish filets—deliciously deep-fried in Heavy-Duty MFB

BREADING VARIATIONS

To each quart of ready-mixed or your own breading, you may add dill weed, 2 teaspoons, or finely grated lemon peel, 1 tablespoon, or fines herbes, 1 teaspoon, or grated Parmesan cheese, 1/4 cup

Special flavor note—try

TOMATO SAUCE DIP

for Breading

Lightly flour seafood, dip in Hunt's Tomato Sauce and coat with breading (tomato sauce takes the place of water, milk or egg wash). Deep fry until rosy-brown in Heavy-Duty MFB at 350°.

BASIC TOMATO SAUCE BATTER

For scallops or fish filets try this piquant batter. It adds exciting color and taste. Deep fry in Heavy-Duty MFB at 350°.

INGREDIENTS	AMOUNT
Eggs	4
Salt	1 tablespoon
Pepper	1/2 teaspoon
Sugar	1 tablespoon
Hunt's Tomato Sauce	1 quart
Flour	3 cups

Quik-Tips from Wesson for Extra Profits

- The shape and taste of seafood "tidbits" have customer popularity whether they're oysters, scallops or economical fish filets cut to similar size. They're high-profit, too.
- Use these breading variations and the new Tomato Sauce Dip for menu refreshment or a Friday treat for the noontime crowd.
- Deep-fry delicate seafoods in all-vegetable, perfectly bland Heavy-Duty MFB.
- Heavy-Duty MFB, the shortening with the high smoke point, stands up under heaviest frying conditions . . . won't gum . . . insures no flavor transfer . . . and bakes beautifully, too.
- Heavy-Duty MFB can't be beat for French fries—the side-order that can't be beat for seafood.

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St. Louis Attractions

You will find that St. Louis has much to offer in the way of interesting places to visit. One of these is *Forest Park*, the second largest city park in the U. S. Covering 1400 acres, Forest Park features such attractions as the St. Louis Zoo, Art Museum, Jewel Box floral display, and the Jefferson Memorial. It was part of the site of the 1904 World's Fair.

A trip to our convention city is generally considered incomplete without a visit to the *St. Louis Zoo.* Open daily throughout the year, the zoo is said to have an exceptionally fine collection of mammals, birds, reptiles, and amphibians. The zoo is a virtual paradise for photographers. Most of the animal units are barless, with reproductions of two types of natural rock formations being used as enclosures. The bears and small mammals live in pits made from casts of limestone formations. Hoofed animals, such as antelope, wild sheep, camels, and llamas, are quartered in moated yards marked off by boulder-encrusted buildings. Boulders and separations are fashioned realistically after red granite formations. Viewed in such surroundings, it is as though the animals were being seen in their natural habitat.

The World's Fair of 1904 left St. Louis with the *City Art Museum,* which is ranked today as one of the four finest art museums in the nation. The permanent collection of the museum includes Rembrandt's "Portrait of a Young Man" and Holbein's "Lady Guldeford," as well as contemporary works by Pablo Picasso. The skylighted Sculpture Hall of the museum is the setting for a fine collection of statues of different periods in bronze, marble, and stone. Among them are the famous Barberini "Satyr" and Rodin's "St. John the Baptist."

The Jewel Box has been called "A fairyland house of glass enclosing unbelievably magnificent flower arrangements." Built in 1936, it is a steel and glass conservatory in which are displayed flowers and plants grown by the city. The Jewel Box faces a series of lily pools. Highlights of the year are the Easter lily display, the chrysanthemums in November, the poinsettias in December, and the rose gardens and gigantic floral clock in summer.

The *Jefferson Memorial Building* was the first public memorial to Thomas Jefferson. It is the home of the Missouri Historical Society's library and museum. Much of the equipment carried by Charles A. Lindbergh on his 1927 flight is housed here.

Exhibitors

As in previous years, the exhibitors at your Annual Meeting will represent the outstanding companies in the food and food service equipment field today. There has been a 70 per cent growth in our exhibition since 1950—an indication of the importance placed by these companies on the market which is represented by our membership.

A recent analysis of our records reveals exhibitor participation as follows:

32%	1 to 5 years
26%	6 to 10 years
20%	11 to 15 years
9%	16 to 20 years
6%	21 to 25 years
7%	26 to 32 years

The Association holds each exhibiting organization in high esteem and appreciates the wealth of audio and visual material it makes available to the members.

The Program

Wednesday, October 25—SURVEY RESEARCH METHODS APPLIED TO DIETARY SURVEYS

Charles A. Metzner, Ph.D., Associate Professor of Public Health Economics, University of Michigan School of Public Health—"Planning for the Application of Survey Research Principles"

Beryl Becker, Research Associate in Public Health Nutrition, University of Michigan School of Public Health—"Findings from a Pilot Study, Using Survey Research Methods"

Thursday, October 26

DIABETES

Herbert Pollack, M.D., New York City—"Current Concepts of Fat in Diabetic Diets"

H. C. Knowles, M.D., Professor of Medicine, Cincinnati General Hospital—"Five-Year Follow-up of Children with Diabetes"

Robert E. Bolinger, M.D., Department of Internal Medicine, University of Kansas Medical Center, Kansas City, Kansas—"Oral Drugs in Relationship to Diet"

Lawrence Hinkle, Jr., M.D., New York Hospital, Cornell Medical Center, New York City—"Effects of Customs, Emotions, and Behavior on Diabetes Mellitus"

ATHEROSCLEROSIS

W. Henry Sebrell, Jr., M.D., Director, Institute of Nutrition Sciences, Columbia University—"Over-All Look at Atherosclerosis"

W. Stanley Hartroft, M.D., Mallinckrodt Professor and Chairman, Department of Pathology, Washington University School of Medicine, St. Louis—"Should the American Diet Be Drastically Modified?"

Jeremiah Stamler, M.D., Director, Division Chronic Disease Control, Chicago Board of Health—"Recent Epidemiologic Studies Relating to Atherosclerosis"

Friday, October 27—THE FUTURE OF THE AMERICAN DIET

Howard Davis, U. S. Department of Agriculture, Washington, D. C.—"Today's Food Programs in the U. S."

Paul Day, Ph.D., Scientific Director, Food and Drug Administration, Washington, D. C.—"Bases for Judging New Foods and Establishing Standards"

Eldon E. Rice, Ph.D., Chief Nutritionist, Research Laboratories, Swift and Company, Chicago—"Studies on the Nature of the Fats in Margarine"

M. Arlene Payne, University of Chicago—"New Ideas for the Therapeutic Dietitian"

IMPORTANT . . . MAIL YOUR APPLICATION PROMPTLY

Application for Housing Accommodations

THE AMERICAN DIETETIC ASSOCIATION

St. Louis, Missouri • October 24-27, 1961

For your convenience in making hotel reservations for the coming meeting of THE AMERICAN DIETETIC ASSOCIATION, hotels, with rates, are listed below. Use the form at the bottom of this page, indicating your first, second and third choice. Because of the limited number of single rooms available, you will stand a much better chance of securing accommodations of your choice if your request calls for rooms to be occupied by two or more persons. All reservations must be cleared through the Housing Bureau. ALL REQUESTS FOR RESERVATIONS MUST GIVE DEFINITE DATE AND HOUR OF ARRIVAL AS WELL AS DEFINITE DATE AND APPROXIMATE HOUR OF DEPARTURE, ALSO NAMES AND ADDRESSES OF ALL PERSONS WHO WILL OCCUPY ACCOMMODATIONS REQUESTED MUST BE INCLUDED.

Hotel	Single Bed	Double Bed	Twin-Bedded	Suites
Chase-Park Plaza	$10.00 - 16.00	$13.00 - 18.00	$14.00 - 22.00	$23.00 - 75.00
Coronado	8.95 - 14.00	11.00 - 15.50	13.50 - 18.00	20.00 - 50.00
Lennox	8.50 - 14.00	10.00 - 12.50	14.00 - 16.00	25.00 - 40.00
Mayfair	8.50 - 15.00	10.00 - 16.00	14.00 - 15.00	26.00 - 50.00
Pick-Mark Twain	7.25 - 9.25	9.25 - 11.50	12.00 - 13.25	19.50 - 29.00
*Sheraton-Jefferson	7.50 - 9.75	10.50 - 13.75	11.25 - 18.00	25.00 - 45.00
Statler-Hilton	8.00 - 11.50	11.00 - 14.50	13.00 - 15.00	29.50 - 36.50
Warwick	5.50 - 8.00	8.50 - 12.00	9.50 - 12.00	

In the event that the hotel room rate structure is changed prior to the above convention these rates will be changed accordingly.

*Headquarters hotel.

ALL RESERVATIONS MUST BE RECEIVED PRIOR TO SEPTEMBER 24, 1961

Convention Reservation Bureau, A.D.A.
911 Locust Street, Room 406
St. Louis 1, Missouri

Please reserve the following accommodations for: THE AMERICAN DIETETIC ASSOCIATION CONVENTION in St. Louis, October 24-27, 1961.

Single Room_____ Double-Bedded Room_____ Twin-Bedded Room_____

2 Room Suite_____ Other Type of Room _____

Rate: From $_____ to $_____ First Choice Hotel_____

Second Choice Hotel_____

Third Choice Hotel_____

Arriving at Hotel (date)_____ hour_____ A.M._____ P.M. Leaving (date)_____

Hour_____ A.M._____ P.M.

THE NAME OF EACH HOTEL GUEST MUST BE LISTED. Therefore, please include the names of both persons for each double room or twin-bedded room requested. Names and addresses of all persons for whom you are requesting reservations and who will occupy the rooms asked for:

_____

_____

_____

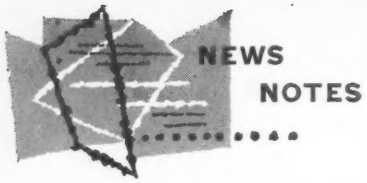
(Individual Requesting Reservations)

Name _____

Address _____

City and State _____

If the hotels of your choice are unable to accept your reservation the Housing Bureau will make as good a reservation as possible elsewhere provided all hotel rooms available have not already been assigned.



Maroon for Home Economics. Maroon is the color which has been approved for academic costumes of those receiving home economics degrees. At the request of the American Home Economics Association, the Committee on Academic Costumes and Ceremonies of the American Council on Education recently allocated this as the specific color to be used to designate home economics. Approximately 500 colleges and universities award degrees to home economics majors; 8,000 such degrees were awarded in 1961, and there are now 42,000 undergraduates majoring in home economics.

Dr. Eppright Receives Borden Award. Ercel S. Eppright, Assistant Dean of Home Economics, Iowa State University, received the $1000, 1961 Borden Award for Fundamental Research in the Field of Nutrition and Experimental Foods. The award was presented by J. H. McCain, Vice-President of The Borden Company at the banquet climaxing the 52nd Annual Meeting of the American Home Economics Association, June 29, in Cleveland, Ohio. The American Home Economics Awards Committee, in selecting Dr. Eppright to receive the cash prize and gold medal, called her a "researcher of rare ability," with organization as one of her special skills. She is the twenty-sixth home economist to receive the Award.

Royal Society of Medicine Affiliate. Mary K. Bloetjes, Ph.D., Head, Institution Management Department of the New York State College of Home Economics at Cornell University, has been elected an affiliate of the Royal Society of Medicine of the United Kingdom. Affiliate membership in the Society is new, designed to promote closer relations between members of the medical profession throughout the world and others with suitable qualifications. Dr. Bloetjes, who has specialized in hospital food administration, holds a Master of Science degree from Columbia University and the Ph.D. degree from Cornell.

Iowa State Makes Appointments. Ercel S. Eppright, Ph.D., Head of the Foods and Nutrition Department of Iowa State University since 1945, has been named to a new administrative post—that of Assistant Dean of Home Economics and Assistant Director of the Iowa Agricultural Experiment Station. She took up her new duties on July 1, following retirement of Pearl Swanson, Ph.D.

A second change in the Iowa State's College of Home Economics has been the promotion of Marjorie M. McKinley, Ph.D., to become Head, Department of Institution Management. Dr. McKinley will assume her new position on August 15 on the retirement of Dr. Grace M. Augustine.

New A.H.E.A. Officers. New national officers for the American Home Economics Association for the 1962-64 term are:

PRESIDENT—Florence W. Low, Head of the Department of Home Economics, Texas A & M College, College Station, Texas.

PROFESSIONAL SECTION CHAIRMEN, COLLEGES AND UNIVERSITIES—Dr. Ruth Highberger, Head, Department of Child Development and Family Relations, College of Home Economics, University of Tennessee, Knoxville.

ELEMENTARY, SECONDARY AND ADULT EDUCATION—Helen T. Clark, Coordinator, Department of Home and Family Life Education, Wichita Public Schools, Wichita, Kansas.

EXTENSION SERVICE — Louise Rosenfeld, Assistant Extension Director, Iowa State University, Ames.

HEALTH AND WELFARE—Mary Reeves, Nutrition Consultant, Children's Bureau, Department of Health, Education, and Welfare, Chicago.

HOME ECONOMISTS IN BUSINESS—Mrs. Helen Halbert, Director, Betty Crocker Kitchens, General Mills, Inc., Minneapolis.

HOME ECONOMISTS IN HOMEMAKING—Mrs. Gayle R. Wilson, Homemaker, Fort Worth, Texas.

INSTITUTION ADMINISTRATION — Dr. Marjorie M. McKinley, Professor, Iowa State University, Ames.

RESEARCH—Dr. Esther L. Batchelder, Director, Clothing and Housing Research Division, Agricultural Research Service, USDA, Washington, D.C.

VICE-PRESIDENT—Dr. Lela O'Toole, Dean of the Division of Home Economics, Oklahoma State University, Stillwater.

RECORDING SECRETARY—Dorothy M. Sherrill, Associate Professor and Home Management Specialist, Oregon State College, Corvallis.

Institute on Nutrition in Chronic Disease. During the week of August 28 through September 1, an Institute on Nutrition in Chronic Disease and in Relation to Aging and Care of the Aged will be held in the School of Public Health, University of North Carolina, Chapel Hill. Purpose of the meeting is to provide a basis for planning and guiding nutrition services for the chronically ill and aging, and to bring together professional public health workers, especially public health nutritionists, who are concerned with chronic disease programs of health promotion, primary and secondary prevention, and rehabilitation. The program is being sponsored and supported by the North Carolina State Board of Health, the Division of Chronic Diseases of the U. S. Public Health Service, and the School of Public Health, University of North Carolina.

Interns Graduate. Thirteen dietetic interns received pins and certificates at a graduation dinner on June 8 at *University of California Hospitals, San Francisco.* The class included:

Marguerite Aalfs, University of Colorado
Barbara Andress, Oregon State College
Andree Charette, University of Montreal
Joan Cooper, University of Arizona
Carolyn Bailey Deighton, Cornell University
Alicia Derderian, University of Maryland
Carmen Espitia, University of Washington
Marianne Gench, Kansas State University
Dorothy Hardie, University of British Columbia
Michelle L'Ecuyer, University of Montreal
Marcia O'Neill, University of California, Berkeley
Dorothy Swisher, The Ohio State University
Maureen Ward, Iowa State University

The following eight dietetic interns took part in graduation exercises at the *VA Hospital, Bronx, New York,* on July 7:

Edith Bauman, University of Minnesota
Joanne Colitz, Marywood College, Scranton, Pennsylvania
Mary Duggan, Regis College, Mattapan, Massachusetts
Karin Ekdahl, University of Illinois
Carole J. Fris, University of Illinois
Elaine Havens, Cornell University
Dorothea Kakavas, University of Delaware
Barbara Swaby, Webster College, Webster Groves, Missouri

During August, the USDA expects the following foods to be in plentiful supply:

Protein foods
Shrimp
Turkeys
Other foods
Peaches
Plums
Summer vegetables

Food and Nutrition Film Catalogue. A new 88-page booklet, "Selected Films and Filmstrips on Food and Nutrition," has been published by the Food and Nutrition Council of Greater New York, Inc. It is a revision of a similar publication, dated 1948 (and six supplements). Included are brief resumés and evaluations of over one

5 2/10 cents per thousand servings

That's how durable and economical Libbey's attractive Columbian tumblers are

An audit of Libbey Heat-Treated Dated Columbian Tumblers in restaurants in 7 major cities showed a glassware cost of 5.2 cents per thousand servings. That's durability . . . and economy!

The easy-to-hold, graceful shape of this beautiful glassware is an asset to any table setting. There is a full range of sizes (5 to 12 ozs.).

You, too, can prove the durability of these tumblers by checking the mark on the bottom. The left number shows the year of manufacture and the right designates the quarter.

For full information on Libbey Heat-Treated Dated Columbian Tumblers, see your nearby Libbey Supply Dealer or write direct to Libbey Glassware, Division of Owens-Illinois, Toledo 1, Ohio.

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OWENS-ILLINOIS
GENERAL OFFICES · TOLEDO 1, OHIO

Patients Convalesce

Better

with good hot food served the

DRI-HEAT WAY!

Centralized food preparation, made possible with a Dri-Heat food system does more than make patients happy. By eliminating extra kitchens and extra help, it cuts your costs sharply and helps you maintain better feeding schedules.

With just one kitchen preparing all food, you eliminate food waste and increase menu variety. You immediately accomplish complete control over portions, appearance, diet restrictions and personnel. Your patients get piping hot food, appetizingly served and always within their prescribed menu limitations.

Most important, the Dri-Heat hot plate keeps food deliciously hot even after it is served to the patients. Slow eaters or disabled patients need never eat cold food—because a Dri-Heat hot plate will keep their food hot as long as one hour after serving.

Investigate the quality-made Dri-Heat system. You can use the entire system or it is possible to adopt various components into your present system to fit your budget.

Stainless steel cover has special heat-trap design

Dri-Heat Hot Plate accommodates any standard china or plastic dish

Special alloy pellets can be used for heating or chilling food

Fully insulated stainless steel base protects diner's hands. Double wall fully insulated—guaranteed not to come apart.

PELLET OVEN

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DRI-HEAT FOOD SYSTEM WRITE, WIRE OR PHONE

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Originators of the modern centralized feeding system.

hundred films and over thirty filmstrips. Information is given also as to the producer and distributor, length, costs of rental or purchase, and the audience for whom the visual aid is suitable. The committee which prepared the material consisted of nutritionists and home economists from various agencies and educational institutions in the Greater New York area.

The catalogue may be obtained for $1.25 from the Bureau of Publications, Teachers College, Columbia University, 525 West 120th Street, New York 27, New York.

Coming Events. Annual Meeting, *Chef's National Convention and Culinary Arts Competition*, Miami Beach, September 23 to 25.

63rd Annual Meeting, *American Hospital Association*, Atlantic City—September 25 to 28.

89th Annual Meeting, *American Public Health Association*, Detroit—November 13 to 17. (The listing of these dates in the June issue was incorrectly stated as being November 13 to 27).

Canadian Dietetic Association Officers, 1961-62. At the Annual Meeting, held in Vancouver, B.C., on June 15, the following officers were elected:

HONORARY PRESIDENT—Robertine Harquail, St. Anne's Hospital, St. Anne de Bellevue, Quebec.

HONORARY VICE-PRESIDENT — Phyllis McFeat, Montreal Children's Hospital, Montreal, Quebec.

PRESIDENT—Helen R. Neilson, School of Household Science, Macdonald College, Quebec.

PRESIDENT-ELECT — Margaret Lang, Department of National Health and Welfare, Ottawa, Ontario.

VICE-PRESIDENT—Eloise Lyons, Food Service, University of Montreal, Quebec.

SECRETARY — Gladys Wynne, Royal Victoria Hospital, Montreal, Quebec.

TREASURER—Ann Diamond, Toronto Western Hospital, Toronto, Ontario.

DIRECTORS, 1961-63

British Columbia — Ruth Blair, U.B.C. Food Services, Vancouver.

Alberta — Marie Brooks, Colonel Belcher Hospital, Calgary.

Saskatchewan—Vivian Bruce, University of Saskatchewan Hospital, Saskatoon.

New Brunswick—Florence Akerley, Moncton Hospital, Moncton.

New Publications of Interest. *Performance Capacity*—a report of a 1957 Symposium sponsored by Food and Container Institute for the Armed Forces and the Quartermaster Research and Engineering Center—concerns factors, criteria, and methods used in assessing physical capability. It is a searching study of the methods used to measure the capacity of human beings to endure work and stress. It contains, as well, the results of performance tests under Arctic conditions (the Eskimo can out-perform the soldier and airman in the treadmill test), under extreme heat (physical fitness and acclimatization are related phenomena), under radiation exposure (voluntary physical activity is greatly depressed), and under high anxiety-stress. The succinct "epilogue" brings the subject up to date, including material made available since the symposium was held. This brochure has been issued in only a limited edition, but copies will be sent to organizations with a "need to know" the results which are reported. Requests should be sent to: Technical Services Office, Quartermaster Food & Container Institute for the Armed Forces, 1819 West Pershing Road, Chicago 9.

* * *

In an entirely different field, the National Health Council has issued a handbook, *Film Planning—A Guide for Voluntary Agencies.* Based on a film workshop sponsored by the Council, this handbook gives practical suggestions for planning, financing, production, promotion, distribution, and evaluation of films. The table of contents lists sections on: "Why Make a Film?" "Kicking It Around," "Who Picks up the Tab?" "'All we want is a great film,'" "Putting the Show on the Road," "Hit or Flop?" and "How to Get Invited into One Million Homes." Although geared primarily to voluntary agency film programs, it can also provide guidelines for schools, civic groups, and business concerns that have a non-theatrical film program or are planning one. Copies may be ordered for $1 each from the National Health Council, 1790 Broadway, New York 19.

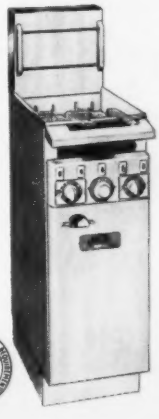
Food Composition Figures. More and more commercial companies are making available data on the food composition of the products they sell. Such information is, of course, part of the dietitian's stock and trade, and she welcomes accurate data of this nature. Below, we are listing several new reports of this nature from two sources.

Campbell Soup Company is distributing to dietitians (available to any A.D.A. member on request) a loose-leaf note book in which data are given on Campbell's soups, Swanson "TV" brand frozen dinners and meat pies, Franco-American products, and Campbell's bean products, tomato juice, and V-8 cocktail vegetable juices. The tables include data on proximate mineral and vitamin composition of the above products; the per cent of the minimum daily requirement of persons over twelve years old (standards of the Food and Drug Administration) on both the 100-gm. and per-serving bases. Additional tables present the tentative daily amino acid requirements, followed by essential amino acid content of Campbell Soup Company products (per 100 gm.) and the per cent of recommended daily intake of amino acids supplied by 100-gm. servings of these products. Requests should be addressed to Campbell Soup Company, Camden 1, New Jersey.

KEATING GAS Fryers outperform previous type with 45% less fat!

St. Mary's Hospital, Kansas City, Mo., replaced two 18-inch fryers with two 14-inch Keating Gas Fryers in a 1,500 meal-a-day operation. The smaller, high-speed Keatings – holding 38 lbs. of fat each, compared to 68 lbs. in the previous type – now do the same work faster and better with 45% less fat.

These Keating Fryers will soon pay for themselves in fat savings and with the unbeatable fuel economy of gas. Moreover, they turn out tastier, more digestible foods with the precise control of gas heat. No excess fat seeps in to make food soggy. This is *controlled fat absorption* – load after load, day after day.



Keating Gas Fryers give you all the advantages of gas: instant recovery, precise control, cleanliness, flexibility, dependability and economy.

For information on Keating Gas Fryers, see your local Gas Company's Commercial Sales Specialist. Or write Keating of Chicago, Inc., 1210 West Van Buren St., Chicago 7, Illinois.
American Gas Association

FOR FRYING... GAS IS GOOD BUSINESS!

A triad of releases from the *Corn Products Institute of Nutrition* seem worthy of mention.

The first is a four-page folder on "Nutritive Values of Food Products Made by Best Foods Division of Corn Products Company." The form of presentation follows that of the recent USDA Home and Garden Bulletin No. 72, "Nutritive Value of Foods," with food groups categorized as "cereals, flour, and starch," "fats, oils, and salad dressings," "sugars and syrups," and "miscellaneous." The Best Foods products are then grouped under these headings, and the following data given for each: household measure; weight; per cent water; calories; grams protein; grams total lipid, saturated fatty acids, oleic and linoleic acid; grams carbohydrate; milligrams of calcium, iron, thiamine, riboflavin, and niacin; and International Units of vitamin A and vitamin D value.

The second is a compilation in tabular form, preceded by a short review of the literature with references, of the composition of fats in ten Best Foods products, including Mazola Corn Oil, Mazola Margarine, Skippy Peanut Butter. One table presents total fat, polyunsaturates, mono-unsaturates, saturates, and P/S (ratio of polyunsaturated to saturated fatty acids). This is followed by individual tables for each of the ten foods, in each of which data in terms of 100 gm., 1 Tbsp., and 1 pt. are given for: total fat, trigylcerides, polyunsaturates, mono-unsaturates, saturates, P/S value, cholesterol, sitosterols, tocopherols, and calories.

A third release of interest is titled "Practical Diets for Serum Cholesterol Control." In it quotations are presented from recent medical articles, indicating recommendations that are currently being made.

All three of these publications may be requested from Corn Products Institute of Nutrition, P.O. Box 345, Argo, Illinois.

Nursing Homes Listed. For the first time, nursing homes, convalescent homes, rehabilitation centers, and homes for the aged providing nursing care under medical supervision are listed this year in the annual Guide Issue of *Hospitals* (August 1). To qualify for such listing, these institutions must meet a list of eight requirements set up in 1958 by the American Hospital Association. One of these requirements reads: "Food served to patients shall meet nutritional and dietary requirements of the patients."

Army Dietitians Meet. A week-long program for administrative dietitians in the Army was conducted at Walter Reed Army Institute of Research, Washington, D. C., June 12 to 17. Problems involving supplies and equipment, budgeting, use of civilian personnel, and training and development of enlisted personnel in food service operations, as well as the feeding of the field Army were discussed. One afternoon was devoted to "Layout Planning," with the program including a panel discussion on future hospital food service layouts by representatives of the Navy, Air Force, VA, and U. S. Public Health Service. Another half-day session included the following talks by doctors from the Office of the Army Surgeon General:

"Dietetic Treatment of the Patient—The Goal"—Brig. Gen. Robert E. Blount, MC, Director of Professional Services

"As a Doctor Sees the Therapeutic Dietitian"—Lt. Col. Robert Pillsbury, M.D., Chief, Professional Education Branch, Directorate of Personnel and Training

Another feature of the program was a presentation by Fern W. Gleiser, Professor of Institution Management, University of Chicago and Consultant in Dietetics to the Army Surgeon General. Her topic was "The Challenge of the Future."

Nutrition Society of Canada. Guelph was the scene of the fourth annual meeting of the Nutrition Society of Canada. The one-day program featured a session of short research papers and a symposium on "Current Problems." A special speaker at the

For FAST toasting—

to avoid food service delays . . . there's no substitute for Savory

Savory's automatic toasting operation makes food service faster, easier and more economical because there's no wait for loading—no delay in toast delivery.
In hospitals, schools and institutions where rigid meal schedules must be maintained, a Savory toaster *keeps pace with demand* by providing 6 to 12 slices of fresh hot toast every minute.
—and Savory toasters are sturdy, and easy to clean, too.
Made of gleaming stainless steel, they'll serve you for years.
Ask your Kitchen Supply Dealer for details, or write:

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NEW FROM SiLite THE FIRST

Perfectly Made Fiber Glass Tray!

In a second we're going to ask you to look at specs. First, we'd like to point out something. There are a lot of manufacturers around selling trays. But for most of them, trays are a step-child. Their real business is something else. But SiLite are tray people through and through. It took us years of research, plenty of modern science and superior engineering skill to be able to make this statement: From every standpoint including price, this is the one perfectly made fiber glass tray.

SPECIFICATIONS

1. Glasteel fiberglass serving trays as manufactured by SiLite, Inc.

2. The glass mat shall be of new fiber glass mat of first quality, Type E, 263 Silane or equal with 4%-6% binder Atlac 363E02Z or equal, having glass fibers of not less than ½ inch or more than two inches in length.

3. Top and bottom surfaces shall have an overlay of non-woven fabric of glass.

4. The polyester resin used shall be an unsaturated polyester alkyd, modified with no more than 35% monomeric styrene, and shall have an A. S. T. M. heat deformation of not less than 105 degrees C. when tested on the cast unfilled resin. The filler and/or pigment content shall be no greater than 1% of the total weight of resin used.

5. The tray edge shall be reinforced with a continuous molded-in steel wire of not less than No. 9 gauge and electroplated after forming.

6. The trays shall have stacking lugs on all corners and such lugs shall be rectangular in shape, not less than ¼" x ½", and approximately .040" deep, so as to assure proper glass content in the raised areas.

7. Trays shall be post cured for a period of 2 hours at a minimum temperature of 200 degrees F.

Available in 8 sizes, round and rectangular. Solid colors, decorative patterns and colors. Holiday colors and patterns. May be had as GLASLITE — without steel ring. For more information write:

No reprocessed mat or powdered glass

stood twice as many drop tests as second best tray!

without it slivering and surface wear occurs

edges protected, too

no inert filler - this is what discolors tray makes cracking and crazing easier

250% harder than substitutes can't rust - adds amazing strength

Some lugs wear holes in tray below

no possibility of odor

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dinner was Dr. Ross A. Chapman, who, as Assistant Director of Scientific Services, discussed the "Research in the Food and Drug Directorate."

Dr. Donald Fraser, Research Institute, Hospital for Sick Children, Toronto, was named the second recipient of the Society's Borden Award. He was cited for his work on vitamin D-refractory rickets in children and on various aspects of calcium and phosphorus metabolism.

New officers of the Society for the coming year will be: President, Dr. E. H. Bensley, Montreal; Vice-President, Dr. R. H. Common, Macdonald College; Treasurer, Dr. J. A. Campbell, Ottawa; and Secretary, Professor E. V. Evans, Ontario Agricultural College, Guelph.

Symposium on Hospital Food Service. On June 28, the New York University Medical Center co-sponsored with S. Blickman, Inc., a symposium on hospital food service, which included discussions of current and future techniques for increasing efficiency and improving food service in older hospitals as well as newer ones. Financing of food service was also considered. The program included:

"Architectural Considerations in Centralizing Food Services" — Isadore Rosenfield, Isadore and Zachary Rosenfield, Architects, New York City

"Current and Future Changes in Hospital Food Services" — Samuel Butterklee, Food Service Manager, N.Y.U. Medical Center

"Centralizing Food Services—A Case History"—Elizabeth Downes, Dietitian, Mountainside Hospital, Montclair, New Jersey

"Equipment for Centralizing Food Services"—Philip Golden, S. Blickman, Inc.

"Getting Food to the Patient"—Fred Heisman, S. Blickman, Inc.

"Financing Changes in Hospitals"—Albert J. Stutzman, Financial Consultant to Ebasco Services, Inc., Management Consultants.

STEAM-CHEF
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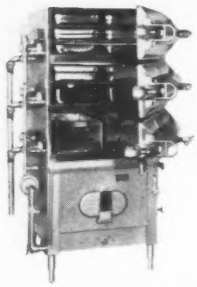

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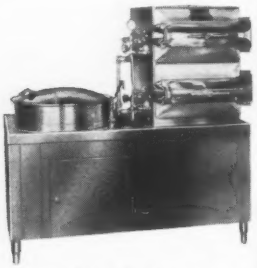

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Carbonated Beverages. All nonalcoholic carbonated beverages will be required to bear a label declaring their ingredients after June 15, 1962, according to a new ruling by the Food and Drug Administration. These soft drinks have been exempted from this requirement, because it was expected that standards of identity would be established for them. This has not occurred, and no such standards are contemplated in the foreseeable future, according to George P. Larrick, Commissioner. Therefore, the exemption from label declaration of ingredients has been rescinded.

Ice Cream Popularity. Since 1950, consumption of ice cream has risen from 17.2 lb. per person to 18 lb. in 1955 and 18.4 lb. in 1960, according to statistics of the USDA. It is served in some 17 million households each day, and one in three now has ice cream on hand at all times. Buying patterns have shifted in the last decade. Ten years ago, only 8 per cent of all ice cream was sold in prepacked, ½-gal. containers. Today, these larger packages account for more than half of all ice cream sales. The change is attributed to the large frozen storage space now available in home refrigerators, plus the saving in shopping time and a drop in retail prices of containers of this size while other food costs have risen. On the other hand, hand-packed ice cream in pint and quart containers and ice cream served in cones and dishes have experienced a drop in sales. In 1950, nearly all ice cream went over the counter via the ice cream dipper; today, only 18 per cent. Prepacked pint sales have also dropped from 25 to 12 per cent, and quarts have almost disappeared.

Ice cream could be an even more popular dessert than it is now, according to Dorothy Dickins, Mississippi Agricultural Experiment Station. When she surveyed 808 Mississippi homemakers, they reported that ice cream is not only generally well liked, but that they recognized its advantages of being ready-prepared and easy to serve. However, a number of the women interviewed did not consider ice cream for "company dinners." Its use could be promoted by pointing

A report of nutrition teaching in elementary textbooks

Leading educators believe that nutrition education should start in the early grades. A good three-quarters of both principals and teachers who think their students do not get three balanced meals *say breakfast is most apt to be neglected.** A recent study made by educational consultants found in 34 elementary health textbooks that among other breakfasts, a basic cereal breakfast appeared in the majority of textbooks examined. The majority of textbooks examined included breakfast teaching ideas based on the Iowa Breakfast Studies.** The Iowa Breakfast Study of School Boys demonstrated that students worked better and the majority of them had a definitely better attitude and a better scholastic record when a good breakfast was eaten.

**A Study of the Teaching of Nutrition in the Public Schools Published by Cereal Institute, Inc., January, 1952*

***A Summary of the Iowa Breakfast Studies Published by Cereal Institute, Inc., May, 1957*

CEREALS ARE LOW IN FAT

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out that it combines well with many different foods and thus should make an ideal combination dessert. She notes also that vanilla ice cream is especially good with foods that offer variety in color, flavor, and texture.

A need for more lay knowledge about the nutritive value of ice cream was indicated, for these homemakers often regarded it as "fattening," and were frequently unaware that other favorite desserts contained more calories. Its value as a source of calcium —a point worth considering in feeding children—may not be known, either.

Water Absorption in Poultry. The USDA recently proposed amending the regulations governing poultry inspection so as to minimize and reduce water absorption by poultry. Some water absorption is inevitable in processing ready-to-cook poultry. The Poultry Division of the Agricultural Marketing Service has been studying the problem for about two years and has now proposed the following limits on water absorption. For poultry to be *consumer-packaged* or *frozen*, or both: turkeys 20 lb. and over—4½ per cent (a reduction from a previous limit of 6 per cent); turkeys 10 to 20 lb.—6 per cent; turkeys under 10 lb.—8 per cent; chickens 5 lb. or less—8 per cent; all other kinds and weights of poultry—6 per cent. For *ice-packed poultry*, the proposed limit is 12 per cent at the processing plant—an amount that will be reduced through drainage during the normal marketing process so that by the time it reaches the retail store and is sold, the moisture level will be within the above limits set for consumer-packaged and frozen products.

Poultry processors must use large quantities of water to turn out the scrupulously clean, completely ready-for-the-pan poultry that American consumers expect and that is required under federal inspection. Good sanitation requires that the birds be thoroughly washed at various stages of processing. Then, as soon as evisceration is completed, the body heat must be quickly removed and the birds chilled rapidly to 40°F. or less. The best means of accomplishing this is to use ice and water or refrigerated water. Some absorption of this water is unavoidable. The need to regulate this absorption came about recently, however, as innovations in processing equipment and techniques began to increase water pick-up beyond the point that is considered necessary.

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News of State Associations

California Dietetic Association. A bibliography, "Nutrition Books for Lay Readers," has been developed by the Community Nutrition Section of the *Bay Region* this year. Copies have been sent to home economics teachers and supervisors throughout the state and have been made available to all hospital libraries in the area. A project now in progress involves developing low-cost menus with recipes for distribution to schools, social workers, public health nurses, child care centers, and so on. Plans are also being made to send professional and scientific publications to several countries in Asia.

In *San Diego*, members participated in the second annual Medical Career Days program sponsored by the San Diego Women's Auxiliary of the Medical Association. High school and college students attended. A booth equipped with literature, slides, tape recorder, and photographs of dietitians at work was set up. Some members served on a panel covering opportunities for dietitians.

Morning coffee hours have been held throughout the *San José-Peninsula Region* for members who are homemakers and unable to attend the regular evening meetings. The plan has proved successful in informing these members of the activities and also encouraging their interest and participation in the association.

Spring meetings of the *Santa Barbara* section covered the following: (1) A radio panel program featuring two dietitians and a physician on the topic, "Food Facts and Fallacies";

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(2) a talk on the aging process by a specialist in obstetrics and gynecology, and (3) "New Ideas in Heredity," presented by Dr. Garrett Hardin, Professor of Biology, University of California (the discussion included new concepts in gene classification, mongoloidism, and phenylketonuria).

Georgia Dietetic Association. Civil Defense and Emergency Mass Feeding is a vital interest of Georgia dietitians. In fact, it is the goal of the Georgia Association's Civil Defense Committee to have all members in the state complete the course in Emergency Mass Feeding, so that they, in turn, will be qualified to assist with other courses of training. On May 18 and 19 of this year, three members were instrumental in the planning and teaching of such a course in Decatur. Attendance included sixteen qualified dietitians and three food service supervisors from Atlanta, Decatur, Tucker, Clarkesville, Griffin, and Stone Mountain. Then on May 23 and 24, two members of the Georgia Association served as official instructors for a similar course at Union City. Emphasis has been placed on instructing county public welfare workers, since emergency feeding in an enemy-caused disaster will be one of the responsibilities of the local Welfare Departments.

Georgia homemakers who are receiving the surplus foods being distributed monthly through the U.S. Department of Agriculture are to benefit by classes of instruction in the care and use of these products. The *Atlanta Dietetic Association* and the Georgia Nutrition Council have planned for group demonstrations for key community leaders (home economics teachers, public health nurses, Red Cross workers, school lunch managers, and home demonstration club members). Eighty-nine persons attended the first demonstration held in DeKalb County.

North Carolina Dietetic Association. On April 5, 6, and 7, the Ninth Annual Institute for Hospital Food Service Supervisors was held in Raleigh. Sponsoring organizations for the Institute were the State Board of Health and the state Hospital and Dietetic Associations. A theme of "Share and Compare to Stimulate Efforts, Improve Methods, and Raise Standards" was carried out. The group-discussion type of program replaced the lecture type used in previous years. A highlight of the program was a demonstration of "Food Service for Tomorrow," in which a hospital food assembly line, using the latest equipment, was simulated. About one-fifth of the A.D.A. members in North Carolina participated in the program or on a planning committee.

South Carolina Dietetic Association. A list of nutrition books was compiled by the Community Nutrition Section in an effort to aid libraries in their selections. The Chief, South Carolina State Library Board accepted the list, and in a special newsletter to members, published it.

A new local association was formed in South Carolina on March 29, when twelve dietitians from the *Piedmont Area* met in Greenville. The group will meet once every three months. The officers of the new association are: Mattie Mae Reavis, Chief Dietitian, Anderson Hospital, Anderson; and Secretary, Marcelle Scogin, Therapeutic Dietitian, Greenville General Hospital.

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Career Guidance in the States

By Frances W. Margut
A.D.A. Career Guidance Chairman

After nine months of reporting career guidance activities of state associations to the Journal, *I am still thrilled and impressed by the number and variety of your accomplishments. I am disappointed to find that only forty-one of the fifty-two associations have been represented during this time, and assure you that this does not indicate favoritism—rather, a lack of material. Please help to make this a truly*

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12 ounces drippings
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national column through contribution of items by each individual association.

Georgia. Did you ever hear of Allied Medical Careers, Inc.? The Georgia Dietetic Association has not only heard of it, but is also represented in that organization. Fundamentally an Allied Medical Career Club provides a setting in which young people interested in all or any para-medical career can meet together to share that interest, explore the opportunities, and discuss requirements. Membership may be coeducational and should be of a workable number, with a suggested range of ten to thirty-five members. If other associations wish to promote community interest in forming such a club for its young people, further information may be obtained from: Allied Medical Careers, Inc., Mrs. Nancy C. Wooten, President, 80 Butler Street, S. E., Atlanta, 3.

Massachusetts. The president of the Massachusetts Dietetic Association is stressing participation in her message to the membership. To quote (in condensed form):

"Any organization is only as strong as the contributions of its members make it. It is felt that many times people would be happy to participate in the work if only they knew something specific to do.

"The need for dietitians is something which requires no elaboration. There are three groups within the association which might be particularly helpful in this regard:

(a) *The younger and junior members.* Experience has shown that girls who attend recruiting programs relate particularly well to those people who are nearer to their own age.

(b) *The homemakers.* Personal contacts of homemaker—ex-dietitians in local communities—can urge guidance directors in high schools to follow up the offers of material and speakers from the state and local associations. Homemakers can offer the same information and help in junior high schools not included in the initial state-wide contact, and introduce the A.D.A. publications and reprints to local libraries.

(c) *All members.* All dietitians are urged to send items to their state bulletin and this JOURNAL, not only for publicity, but as helpful hints for others to follow."

Missouri. The career guidance chairman of the St. Louis Dietetic Association asks: "Will you join me in doffing my hat to members, first for their wonderful response to my SOS for committee members, and second, for what they have accomplished by their 'attack from all sides'? These things have been done:

(a) Spot announcements to recruit dietitians over eleven different stations during Missouri Home Economics Association week.

(b) Personalized letters with enclosed material to twenty-one girls who requested information on 'how to be a dietitian,' resulting in several good 'prospects.'

(e) Seventy-four home economics teachers in St. Louis and St. Louis County, plus those in local parochial schools, made aware of the availability of *View from the Mountain* and "Take a Good Look," with follow-up promotional flyers sent to stimulate use.

(d) Twenty-one adult youth leaders and members of forty-one women's extension clubs of St. Louis County invited to see "Take a Good Look."

(e) Teaming up with the Committee for Health and Welfare Recruitment in a school counselors' project. Two hundred fifty kits on health careers are being compiled for distribution to St. Louis, St. Louis County, and St. Charles County counselors."

New York State. Career guidance resources are steadily growing in New York State. The latest development: the Film Library of Cornell University is prepared to purchase for the state dietetic association, a set of the new slides on dietetic careers.

Local career guidance committees received a helping hand from the state association. It authorized a mailing of career guidance material to all junior and senior public high schools in state. Information about the field of dietetics is now in the hands of guidance coun-

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selors in every locality. Application forms for the first scholarship (for $200) offered by the New York State Dietetic Association to a high school senior who plans to enter a college of home economics were included in the material. Altogether, 3000 copies each of "Dietetics as a Profession," New York State Dietetic Association's own "Directory for Planning a Career in Dietetics," and the scholarship announcement were distributed through the State Department of Education.

South Carolina. The career guidance chairman of this state association writes:

"I participated in a survey conducted by the South Carolina Director of Home Economics Education. One of the questions was, "What do you think are the advantages of college students majoring in home economics?" Not a person interviewed knew that home economics education was a requisite for dietetics. I also learned that the students who had studied home economics in high school invariably gave home management as the major emphasis. They simply have not been told anything about dietetics in discussing careers with their home economics teachers or counselors.

"At last we seem to have hit on a system for publicizing dietetics that worked. The letters mailed to the high school counselors telling them about the availability of our two state films and how to request them has brought a wonderful response. Both films are booked solid until the close of the school term. We could have booked two films of each as easily."

Tennessee. This is one of the three state associations which have worked with the A.D.A. office to provide career material for all vocational counselors in junior and senior high schools at the request of their State Boards of Education. (The others are Delaware and Massachusetts.) Not satisfied with merely furnishing the material, Tennessee has included in each kit an offer of personal assistance written in such friendly, enthusiastic terms, that it genuinely invites contacts. (And I understand that progressive "reminders" are contemplated to keep the ball rolling.)

Incidentally, many associations are finding that concentration on one or two well coordinated, state-wide projects brings bigger and better results than more numerous, but scattered individual efforts. It is anticipated that next year this type of program will increase and expand.

History of The American Dietetic Association

1917-1959

Mary I. Barber, Editor

This is the first official history of the ADA from its inception in 1917 through 1959. More than being merely a record of the Association, its origin, structure, aims and accomplishments, this new book includes the many personalities that represent its leadership and explores the role of the dietitian from ancient times to the Space Age.

Chapter 1 considers the term "dietitian" historically, and presents a definition which describes the dietitian's responsibilities today. Chapter 2 outlines the history of dietetics from the ancient Ebers papyrus to the present, highlighting the achievements of great figures in the history of nutrition.

Chapter 3 gives an interesting account of the founding of the ADA. Chapters 4 through 7 record by decades the spectacular advances both of the ADA and of the science in general. Chapters 8 through 14 describe the structure of the Association, and the work of the various Committees and Sections devoted to education, community nutrition, diet therapy, etc.

Chapters 15 through 19 cover the history of dietitians in military and government service, the United States Children's Bureau and the role of the Journal of the ADA and the Association's Public Relations Department. Chapter 20 relates the challenging aspects of dietetics in the Space Age.

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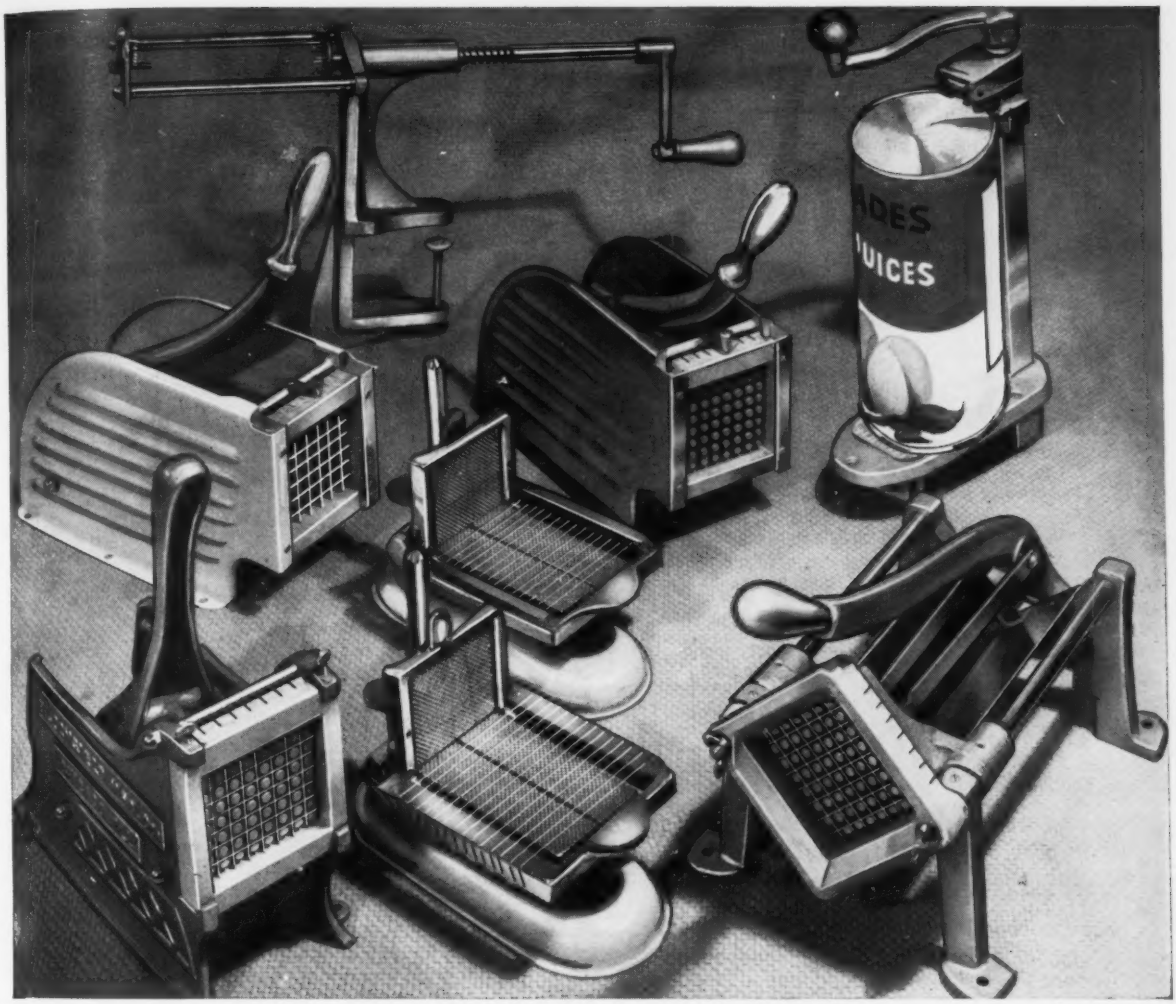
Public Relations in the States

By HELEN G. INGERSON
A.D.A. Public Relations Chairman

Pennsylvania. The Philadelphia Dietetic Association was the hostess club on April 15 to the twenty-third Friendship Fete, an occasion of great tradition. They thereby added the 23rd link in the Golden Chain of Friendship. The women's clubs of Philadelphia participate in this annual event and take turns as the sponsoring club. The idea of the Friendship Fete is to promote and foster friendship and to honor a woman whose life and work are an example of this. Miss Grace Nadig, Professor of Home Economics and Head of the Department of Home Economics at Temple University, was chosen for her service with the Food and Agriculture Organization of the United Nations, for training she gave young people at UNESCO's Arab States Fundamental Education Center in Egypt, and for her development of students at Temple University and contributions to related professions. Dr. Ruth M. Leverton, speaker, carried out the 1961 theme, "Food—the Link of Friendship," in her talk, "Food in Today's World," and the international flavor was carried out in the luncheon menu. To publicize the Fete, pictures were borrowed from FAO, and the Public Relations Department at the Philadelphia National Bank exhibited them.



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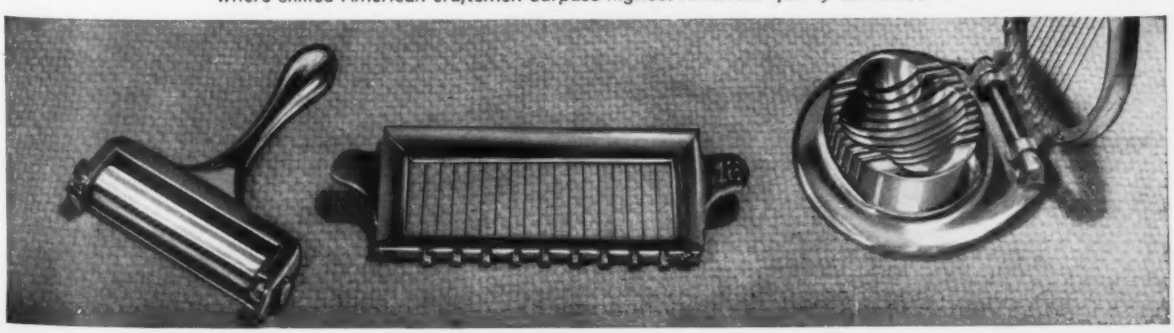

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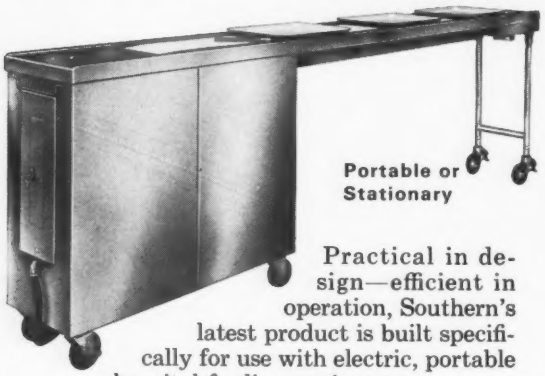

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South Dakota. Dietitians of the South Dakota Dietetic Association take an active part every year in the program planning for a Cook's Short Course. The one-day-a-year meeting is held on the State College Campus in Brookings. The fourth Hospital and Nursing Home Cook's Short Course, sponsored by South Dakota Dietetic Association with the cooperation of the Division of Home Economics, South Dakota State College and the Division of Hospital Facilities, South Dakota Department of Health, was held June 22. This year the program subjects and speakers were: "Jets to Jam," Dr. Gladys Roehm, Professor, School of Home Economics, Montana State College; "Work Smarter, Not Harder," Carolyn Cason, Director, Food Service, Rice University, Houston; "Let's Have Better Kitchen Habits," Dr. Robert Pengra, Assistant Professor, Bacteriology, South Dakota State College; "The Preparation and Serving of Salads," Eva Eddy, Food Supervisor, College Food Service, South Dakota State College; and discussion groups on "Salads and the Menus."

Tennessee. A committee of the Memphis area dietitians recently prepared a sample nutrition program and presented it at a nutrition workshop for the Memphis Council of Parents and Teachers Association. As part of the program they displayed trays of food set up to show amounts supplying one day's needs based on the National Research Council's Recommended Dietary Allowances. The sample program includes a food facts I.Q. quiz and a script to use in conjunction with slides from the federal Extension Service showing in graphic form the nutritional state of teen-agers. The script was adapted from the government bulletin, "Improving Teen-Age Nutrition," assembled by the 4-H Foods and Nutrition Development Committee and is available from the Superintendent of Documents for 15 cents.

Washington State. If the number of requests for material indicate interest and success of a program, certainly the recent nutrition series done on the Bea Donovan Homemaker Show was successful. Over 1000 nutrition pamphlets were sent out. The dietitians of the Washington State Dietetic Association, in cooperation with the HEIB group, worked on the program and also helped to answer the 150 plus inquiries received. A nutritionist of the Seattle-King County Health Department appeared on each of the eight shows with guest speakers.

Association Activities

A.D.A. Executive Board Meets. The A.D.A. Executive Board met in Chi-

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cago June 9 through 13. Board, Committee, and Section Activities were discussed, and new business was brought before the group. Also, reports were presented by members of Headquarters staff.

Workshop for Teaching Dietitians. A Workshop for Teaching Dietitians, sponsored by A.D.A., will be held in Chicago at Navy Pier, September 5 to 9, 1961 (as previously announced in the May 1961 *Courier*). This workshop is intended for A.D.A. members only and is applicable to those in all areas of teaching, whether they be teaching employees, college students, student nurses, or medical students, etc. Tuition is $45 for the week, payable to The American Dietetic Association. Housing will be at the Allerton Hotel.

Pre-registration is required, and further information may be secured from the A.D.A. Headquarters office.

A.D.A. Representatives. Fern Gleiser, from The University of Chicago, served as our official representative at the 1961 *Hennessy Trophy luncheon* on May 21 in Chicago, sponsored by the National Restaurant Association. The award represents the best food service among the Air Force bases world-wide, and was presented to Donaldson Air Force Base, South Carolina a base of the military air transport service. Guest speaker was Charles G. Mortimer, President of the Nutrition Foundation, Inc.

LeVelle Wood, from The Ohio State University, was A.D.A. representative at the reception and banquet of *Institutions Magazine's* 15th Annual Food Service Contest on May 23 in Chicago.

Beulah Hunzicker, from the University of Illinois, served as our representative at the luncheon meeting of the *Food Facilities Engineering Society* May 21 in Chicago.

Portia G. Morris, Ph.D., Albion, Michigan, represented us officially at the inauguration of James W. Miller, Ph.D., as President of *Western Michigan University*, Kalamazoo, May 20.

American National Red Cross. Janet M. Bryan, Cincinnati, and our representative at The American National Red Cross Convention in Cincinnati, May 8 to 10, gives us a few highlights of the meeting.

Over 4000 volunteers attended the meeting. The opportunity of participating in Red Cross activities was emphasized. Also included on the program this year was a service session for volunteer instructors and committee members participating in emergency mass feeding training and other facets of chapter food and nutrition programs.

44th A.D.A. Annual Meeting. Plan now to attend the 44th A.D.A. Annual Meeting to be held in St. Louis, October 24 to 27, 1961. Each of you received recently a hotel reservation form as a part of the A.D.A. publicity mailing.

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News of Products and Services

A clock-timer device, "Markomatic," which automatically controls cooking time, shuts off the pilot light, provides visible indication of the compartments in use, and exhausts all water and steam to prevent overcooking, is now available for all *Market Forge Company* steam cookers.

With four basic cabinet lengths, it is possible to work out over thirty arrangements with the new modular steam-cooking components offered for the *Market Forge Company*. Compartment cookers, Steam-Its, 10- and 20-qt. tilting kettles, and 30- and 40-gal. stationary or tilting kettles may be combined, to achieve a custom look without planning and installation expense. Cabinets are stainless steel with 6-in. adjustable bullet feet to provide access for cleaning. The cabinet houses a gas or electric steam boiler on self-generated models. Only one connection is required for each service, and all drains are piped to a common line beneath the cabinet.

For a training school for sales personnel, The Institutional Products Division of *DCA Food Industries* used the laboratory and classroom facilities of the American Institute of Baking, Chicago, and the General Electric test kitchens in Chicago Heights. Sales personnel were taught how to make thirty-six different cakes from the new Downyflake Variety Cake Mix, muffins from Downyflake Honey Bran Muffin Mix, pancakes from the Buckwheat Pancake Mix (including pointers on how to flip a pancake). The program also served as a refresher course in preparing older products and the new "Lawry's Spanish Rice Mix," which is distributed by DCA with other Lawry products. Thus prepared, salesmen are now able to go right into their customers' kitchens to teach employees how to use their products.

Waring Products Corporation, a subsidiary of Dynamics Corporation of America, has developed a new model blender for commercial, medical, scientific, dietetic, and industrial use. Designed to withstand heavy use and sterilization without breakage, the new Waring Blendor features a stainless steel container and a new, super-power, high torque, two-speed motor. Capacity of the container is 37½ oz. The unit operates on 115-volt, AC-DC current and accommodates a Waring Pyrex container or Aseptic Dispersal.

At the National Restaurant Exposition in May, *Food Machinery and Chemical Corporation* introduced two new utensil washers, Models 104 and 204. These pot-and-pan washers require only one operator to stack utensils into a rack, place the rack in the machine and press the control button. The utensils are greaselessly clean and sterilized in less than 2 min. Front-operated stainless steel doors are featured.

As part of the *National Dairy Council's* program on nutrition research and health education, new materials are prepared with current information of interest to professional and consumer groups. Recently issued is "Calorie Restricted Diets for Weight Reduction," designed to assist physicians and dietitians in counseling patients with weight problems. A new series giving 1000- and 1200-calorie levels now supplement the earlier weight control sheets at the 1400- and 1800-calorie level. In each series, total food for the day is listed and a daily meal pattern with sample menus is given. An explanatory sheet for the physician is also available. . . . A four-page folder, "Choose Your Calories by the Company They Keep," is an information sheet on ten major nutrients, their functions and food sources.

Instant Mashed Potatoes, eight servings in a package, from *General Mills* has a new formulation using non-fat dry milk solids. No milk need be added; only water and butter to stir in for creamy-smooth potatoes.

From the Betty Crocker Kitchens of *General Mills* comes a new Lemon Chiffon Cake Mix—lemon yellow, as high, light, and tender as angel food but rich and moist as butter cake. An average slice has only 150 calories. If calories are not a problem, recipes for meringue chiffon or citrus loaf cake are inside the package. The cake is good with whipped cream, ice cream, frozen fruit, or a fruit-nut topping.

A completely new, revised edition of the booklet, "Milk . . . a Vital Food for Folk of All Ages," has been released by *The Borden Company*. In this edition, a new section briefly describes fluid milks, with a table of the fatty acid composition of milk fat. The nutrients in milk and the part each serves in body metabolism are discussed.

Borden is now distributing a new convenience food, "Quick Cook Potato Slices." Sliced 1/32 in. thick, the potatoes are partly cooked, then dehydrated. Reconstituted in water, the slices swell to ⅛ in. and cook in about half the usual time. They are processed with small amounts of calcium chloride for firmness and sodium sulphite to lengthen shelf-life and protect the natural white color of raw potatoes. They may be used in any recipe calling for raw or cooked potato slices, such as casseroles, potato salad, or home fries.

A new feature of the 1961 model *Middleby-Marshall Oven Company's* Lucky 7 Oven is its "Pan-Jam-Ban," a safety device to eliminate damage caused by carelessly loaded overhanging pans. A thicker front wall, automatic belt adjustment, new tray indicator dial, and new heat-resistant motor drive are other features. The oven is available with seven 18 by 26 in. trays or six oversize trays.